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# SEAMANSHIP DEPARTMENT NOTES

# SEAMANSHIP DEPARTMENT NOTES

## U. S. NAVAL ACADEMY
## ANNAPOLIS, MARYLAND

NOVEMBER, 1917

ANNAPOLIS, MD.
THE UNITED STATES NAVAL INSTITUTE
1918

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U. S. NAVAL ACADEMY.

ANNAPOLIS, MARYLAND.

November, 1917.

The Seamanship Department Notes are supplementary to Knight's Modern Seamanship and The Deck and Boat Book, U. S. Navy. Many of these notes have been issued to midshipmen in pamphlet form. Owing to the great increase in the number of midshipmen at the Naval Academy, this is no longer practicable.

G. W. LAWS,
*Captain, U. S. Navy,*
*Head of Department of Seamanship.*

334882

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## CHAPTER I.

# CUTTERS.

### DETAILED INSTRUCTIONS FOR CUTTER DRILL.

1. The boats' crews are detailed permanently. The coxswains of the boats for each drill will be detailed from the crews by the officer having charge of the drill.

2. At the command "Man the boats," midshipmen shall fall out, proceed at the double, and fall in by crews at the boats, the first crew abreast No. 1 or any designated cutter. On falling in, crews will dress to the left.

3. The coxswain of each boat shall detail midshipmen to the oars. The boats' crews shall remain standing at attention until the command is given "Stand by to lower," at which order the crews shall execute "About face" and the bow and stroke oarsmen shall get into the boat. The port stroke oarsman shall ship the rudder and tiller, the starboard stroke oarsman shall ship the plug, and the bowmen shall see their boat-hooks clear and ready. The second stroke oarsmen shall see the boat falls clear and shall stand by to lower. When the boat is ready for lowering the starboard stroke oarsman shall hold up his hand to signify this fact to the coxswain, who shall report to the officer in charge of the cutter drill, "No. —, ready, sir."

4. At the command "Lower away together," the boats shall be lowered smartly, taking time from the lowest numbered boat. If properly done, the boats will take the water simultaneously. The starboard bow and stroke oarsmen shall unhook the falls, keeping the lower blocks upright while being rounded up, signal when high, and pass the bights of the stoppers over the lower blocks and through the parts of the falls, middling the parts of the stoppers. The port stroke oarsman shall take his thwart. The port bow oarsman shall get out his boat-hook and hold on. Both bow oarsmen shall stand well to starboard to permit the crew to embark over the port bow. The starboard stroke oarsman shall steady the boat aft by holding on to the stopper until relieved by the coxswain.

5. At the command "Embark," the crew shall embark smartly *without noise,* each man taking his thwart, sitting erect and facing aft with eyes in the boat. The coxswain will then give the command, "Stand by the oars." At the command "Shove off," the bowmen of No. 1 boat shall shove their boat well clear of the seawall, and as soon as the bow of No. 1 passes the stern

of No. 2, No. 2 shall shove off, and so forth. The boats must be shoved off promptly or distance will be lost.

6. As soon as each boat is clear of the shed, the coxswain shall command "Out oars" and then "Stern all." In backing out it is absolutely necessary that the boats be backed straight away so as not to interfere with other boats.

7. When all boats have shoved off, the command "Form column" will be given. At this command all boats shall give way starboard and back strong port so that the boats will turn on their heels. No. 1 boat shall stand out of the basin straight across the river, other boats following in order and easing into column.

8. In returning to the boatshed the coxswain shall not boat the oars until the way is sufficiently reduced to only carry the boat to the seawall. The coxswain shall give the command "Disembark." The second bow oarsmen shall lead out the falls on the double. The port stroke oarsman shall unship the rudder and steady the boat. The starboard stroke oarsman shall hook the after fall and tend it, later taking out the plug. The starboard bow oarsman shall hook the forward fall and tend it. The port bow oarsman shall assist in steadying the boat. When the boat is ready for hoisting the port bow and port stroke oarsmen shall disembark and pass the stoppers and then assist in laying up the falls. The second stroke oarsmen shall belay and see the falls laid up. The crew shall then fall in and the coxswain shall inspect the boat, take his position in front of his crew and report to the officer in charge of the drill, "No. —, secure." If there are any defects in the boat gear or if the boat has grounded or sustained any injury he shall report these facts to the officer in charge of the drill.

9. *Silence must be preserved in the boats and while lowering and hoisting.*

## NOTES ON PULLING.

These notes are supplementary to the Instructions contained in the Deck and Boat Book, 1914, pages 34 to 40.

### Preliminary.

The stroke formerly in general use throughout the service has deteriorated in late years from a long swinging stroke to a short chopping stroke known as a "lazy stroke." In this stroke the muscles of the back, loins, and legs are not used.

The following excellent description of the time honored "Navy stroke" has been taken from the British Manual of Seamanship. It is hoped that all midshipmen will learn the details of the stroke thoroughly so that they can teach it to the men under them when they have gone into the service:

### Instructions.

The boat's crew will take their places in the boat on the thwarts assigned, see their stretchers in place and their oars clear. Each midshipman will grasp his oar with outboard hand on the loom palm up well toward the leather, inboard hand on the handle palm down. At the order " Stand by the oars " he will lift the blade of his oar on the gunwale of the boat and shove it well forward to be ready for tossing.

**Up Oars.**—The coxswain, when everything is ready, will give the order " Up oars," when, taking time by the stroke oarsman, the crew will toss their oars to a vertical position, placing the handles on the bottom boards between their feet. The oars must be kept upright and the blades fore and aft in line with the stroke oarsmen's blades. The coxswain should see that each midshipman has his proper oar and the correct position on the thwart. This position is square, as if ready to pull on either side; with shoulders set well back and stiffened; heels together on the stretcher; toes turned out at an angle of 45 degrees; head square with eyes directly aft; the seat occupying about two-thirds of the thwart.

**Shove Off.**—At this order from the coxswain, the bowmen and the inside stroke oarsman, who have been holding on to the side of the ship or float, shove the boat off with their boat-hooks. They then place their boat-hooks in the boat amidships with the hooks forward and aft. The stroke oarsman tosses his oar up independently. The bowmen run their oar blades out over the bows together, then await further orders. If the rest of the crew, as is usually the case, have commenced pulling, they will out oars together and pick up the stroke. When fenders are fitted they are usually hauled in at the order to " Shove off," if not, a separate order " In fenders " is given.

**Let Fall.**—As soon as the boat is clear the coxswain gives the order " Let fall," at which the crew lift their oars until the handles are clear of their knees and lower them quietly into the rowlocks. This position, when the oarblades are feathered and in line with the gunwale, is called " Oars."

**Pulling by Numbers.**—The crew will first be taught to pull by numbers as follows: From the position of " oars " the order is given to " Stand by." At this order the body is bent forward at the hips and between the thighs, back straight, shoulders braced back, the arms extended to the full extent, the knees well apart, chest and belly full and prominent. The blade of the oar should be at right angles to the water and about one foot above it. Both hands should grasp the oar handle with the thumbs underneath. The head must be kept erect, the eyes on the back of the man in front.

*One.*—Drop the blades of the oars into the water without chop or splash. As the oar enters the water (keeping the surface of the blade perpendicular) put the weight of the body on the oar, arms and back remaining straight,

drive with the legs against the stretcher until they are straightened out and the body is about 22½ degrees past the perpendicular. The body must then remain stationary, while the arms bring the oar home by bending the elbows and keeping them close to the body until the root of the thumb touches the breast about one inch below the nipple.

NOTE.—The knees during this movement should close slightly. This movement is an excellent exercise for strengthening the muscles of the back, thighs, stomach, and loins, which play such an important part in rowing. The stroke should be begun by trying to feel the water, and it should then develop into a hard, steady pull.

*Two.*—Drop the arms until the blade is clear of the water.

*Three.*—Turn the wrists by dropping them bringing the knuckles up, and feather the oar.

*Four.*—Shoot the arms out sharply, but without a jerk, and swing the body slowly and steadily forward to the position of "Stand by." Care should be taken that the body comes steadily aft, otherwise the oarsmen will drop their shoulders and heads, and the blades, instead of being as close to the water as possible on the return, are uneven and cannot enter the water together.

After the motions have been distinctly taught, combine the first, second, and third at the order "Stroke," completing the fourth motion at the word "Recover."

When the crews have been thoroughly practiced in the combination, pulling in quick time should be carried out, the order being to "Give way."

Midshipmen should always remember that the main object is to pull correctly, and that pulling hard and for a long distance is merely a matter of practice, but that a bad style once contracted is like a bad habit, hard to get out of. It must be impressed upon the boat's crew that their oars are to be pulled more by their legs than by their arms, and that both hands, both arms, both shoulders, each loin, and both legs and feet should bear an equal strain throughout the stroke.

The stroke should be finished with the shoulders and the muscles that work them, and the biceps should be passive throughout the stroke.

The whole secret of pulling lies in the body swing and good leg work against the stretcher.

**Laying on Oars.**—At the order "Oars" the crew will come to the position "Oars," as previously described, taking time from the stroke oars.

### Explanatory Notes.

1. **Swing.**—The aim in this should be to swing the body as far as possible from the hips without bending the back, being careful to let the head swing with the body. The swing must be slow and balanced, for the time occupied

in coming forward should be the body's rest, when the easy measured swing, erect head, braced shoulders and open chest enable heart and lungs to work freely and easily, in preparation for a definite beginning of the next stroke. As the body swings, the hands should be at the same time stretching and reaching out as if striving to touch something which is constantly evading them.

2. **Straight Backs.**—As far as possible, a straight back should be acquired. The values of a straight back are as follows:

(a) The swing must be from the hips, and not from any point in the middle of the back as a secondary pivot.

(b) The straightness of the back eases the respiratory organs.

3. **Use of Arms.**—The arms must be straight when swinging back. They must be considered as merely connecting rods between the body and the oars. The use of the biceps in rowing should be discouraged, as the man who finishes his stroke by the aid of the biceps infallibly sticks his elbows out at right angles to his ribs, thus giving a weak as well as a cramped and ugly finish.

4. Do not meet your oar, *i. e.,* keep your body back until your hands have come in. If you pull yourself forward to meet your oar, you will certainly shorten your stroke prematurely.

5. **Turning of Hands Towards End of Stroke.**—Hands must be dropped before the wrists are turned, to get blade clear of water first, and to insure a neat, clean feather. If the oar is feathered properly it comes out like a knife.

6. **Use of Legs.**—When the beginner has been taught the use of his body, and has begun to use the swing of it for the main motive power of the stroke, he can then be taught to apply extra power with his feet at the right time to increase the power and the swing of the body. As soon as the body feels the strain of the oar, legs instinctively stiffen themselves against the stretcher. They should be kept in this rigid posture, supporting the body throughout the stroke. The rigidity should commence at the instant that the oar touches the water and the strain begins to fall upon the shoulders.

7. **Recovery.**—This is largely dependent upon the abdominal muscles, and to get quick recovery these muscles must be exercised and developed. The muscles of the legs, thighs, and loins should all join with those of the abdomen in the recovery. The first part of the recovery should be the most rapid.

8. **Catch.**—The beginning of the stroke should be the most forcible part. This " catch " should be driven from the body as if the whole body were to be lifted off the seat by the joint support of the oar and stretcher. Avoid striking the water in the " catch."

9. **Form.**—May be defined and made up of square shoulders, straight swing from the loins, elastic recovery, and absence of doubling up at the finish.

10. **Distance of Swing Back.**—In deciding this, two things must be considered, viz.:

(a) Whether the man is physically capable of maintaining his length of "swing back" without sacrificing some of his "reach forward."

(b) Whether his powers of recovery are adequate to the distance through which his body has to be recovered for the next stroke.

If both these can be done, then the man who fulfils these conditions is doing his work to best advantage, if his body, when straight at the end of the stroke, makes an angle of about 22½ degrees with the perpendicular, the reach forward being full.

It is more economical to recovery to swing fairly well back and to row a fewer number of long strokes than a large number of short strokes.

In teaching a man to swing back, he should be told to hold his head well up. The weight, if thrown back, assists his swing, while if hanging forward, it acts in a contrary direction.

*Insist on silence being kept in the boat.*

*Insist on eyes being kept in the boat.*

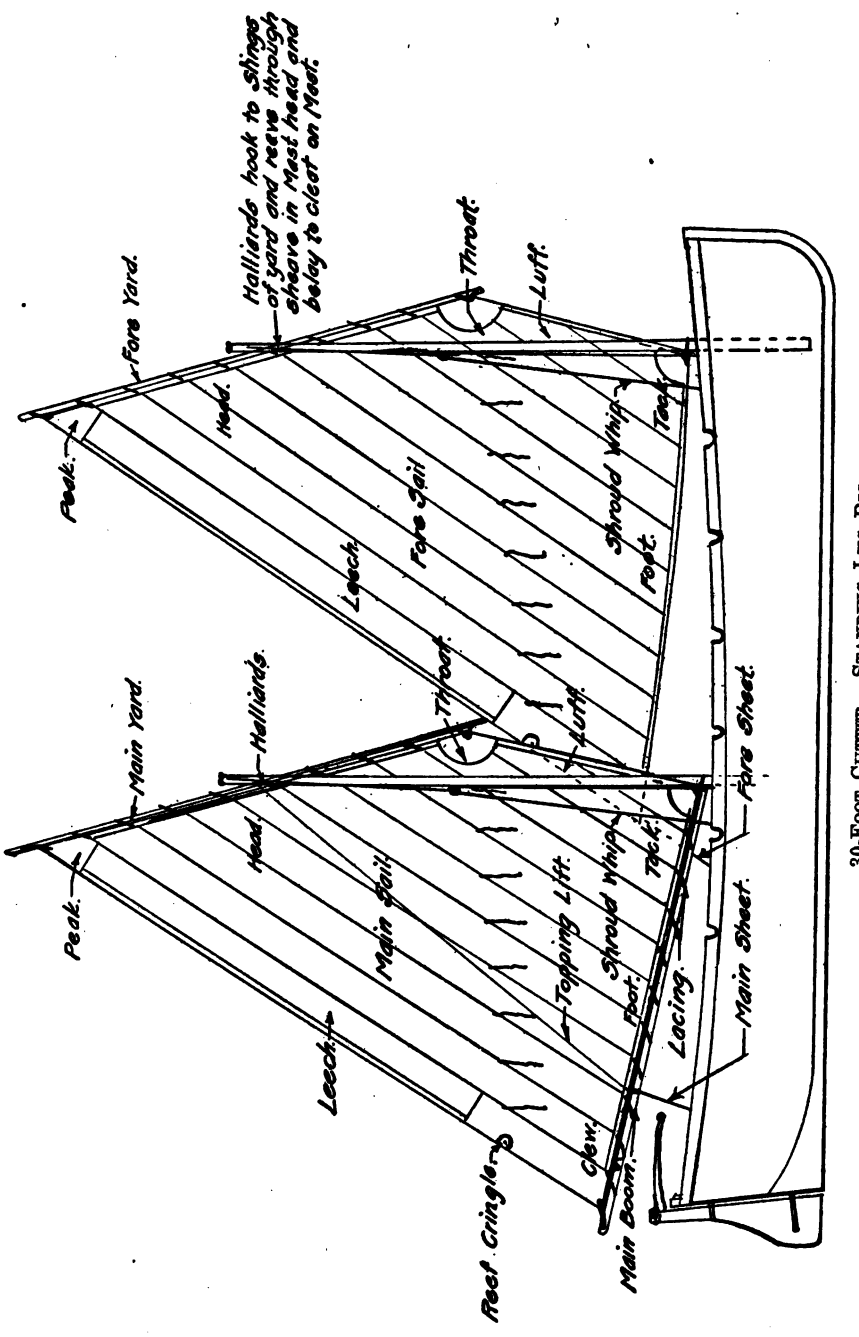
*Allow no inattention.*

## DRILL FOR NAVY STANDING LUG RIG (NO JIB).

By LIEUTENANT J. R. BEARDALL, U. S. Navy.

### 1. Being Under Oars, To Make Sail.

| COMMAND. | DUTIES. |
|---|---|
| (a) *Way enough*..... | Oars are boated as before described. |
| (b) *Stand by to step masts.* | All hands cast off spar covers and unlash sails from masts. |
| | Starboard thwartmen launch mainmast forward until heel of mast is even with step; halliard sheaves fore and aft, standing part of the halliards abaft the mast, and raise the masthead slightly. |
| | Similarly, port thwartmen launch foremast to position and raise the masthead slightly. |
| | The crew remain seated whenever their duties will permit, always *keeping down in the boat.* |
| (c) *Step the masts*..... | Starboard thwartmen stand on bottom boards and raise mainmast. |
| | Port thwartmen stand on bottom boards and raise foremast. |




30-FOOT CUTTER. STANDING LUG RIG.

| COMMAND. | DUTIES. |
|---|---|
| | Bow and stroke oarsmen get masts on proper slew and when nearly vertical guide them into the steps. |
| | Bow and stroke oarsmen and second bow and second stroke set up shrouds. |
| (d) *Stand by to make sail.* | Starboard thwartmen light the mainsail aft and hook on the yard; second starboard stroke secures the jaws of the main-boom in place. |
| | Second port stroke stands by to hoist away on the halliards. |
| | Port thwartmen clear away the foresail and hook on the yard; starboard bowman lashes tack of foresail to eyebolt in foremast; port bowman stands by to hoist away on halliards. |
| | Men most convenient pass sheets aft on their respective sides and tend them. |
| | Starboard stroke reports when ready aft. |
| | Starboard bowman reports when ready forward. |
| (e) *With starboard (or port) sheet, make sail.* | Hoist yards chock up, lugs to leeward. Haul aft sheets on the designated side and tend them—never belay. |
| | Bowmen keep a bright lookout ahead and report promptly the proximity of dangers. |
| | Station two men under foot of foresail, distribute the remainder of the crew as necessary to give the boat best trim for sailing and handling. |
| | Constantly bear in mind that a boat will sail and handle her best when making good headway through the water. |

**2. To Tack.**

| | |
|---|---|
| (a) *Ready about*..... | Given as a warning to the crew to prepare for the evolution. The coxswain gives the boat a good full, waits for a smooth time, then *eases* down the tiller. At the same time the man tending the main-sheet hauls the main-boom amidships slowly. (Care must be taken not to haul it across the midship line, for it will then act as a back sail.) Keep sails drawing and boat going ahead as long as possible. As the boat's head comes to the wind the man tending the fore-sheet takes in the slack as it comes to him. |

| COMMAND. | DUTIES. |
|---|---|
| (b) *Shift over fore-sheet.* | As the boat's head passes the wind and the foresail fills from the new side, the men under the fore-sail grasp the foot of it and carry it bodily across *with the wind;* not forcing it over, but carrying it with the wind, keeping it from flapping and shifting the sheet smartly as the foot of the sail goes across. If the boat gathers sternboard shift the tiller. |
| (c) *Haul aft sheets....* | When the boat has passed the wind and is on the new tack, trim the sails as desired. It is not necessary to dip the lug in going about. However, in making a long board on one tack, it may be worth while to dip the lugs to leeward as the sails will stand a little better. This can usually be done without touching the halliards, a man grasping the luff of the sail and the forward end of the yard and bearing down on them while the sheet is slack. |

### 3. To Wear.

| | |
|---|---|
| (a) *Stand by to wear...* | Given as a warning to the crew to prepare for the evolution. The coxswain puts the tiller up when ready. |
| (b) *Ease off the main-sheet.* | Given as the boat's head pays off, in order to get the maximum effect of the mainsail in increasing her headway. Keep fast fore-sheet until wind is abeam as it helps pay her head off. |
| (c) *Ease off fore-sheet* | Given when wind is abeam. Slack off the sheet gradually to give headway. |
| (d) *Up mainsail.....* | Given when the wind comes nearly aft. Top up the main-boom. This is unnecessary in a light breeze, but in a moderate breeze or anything stronger it should be done on account of the danger of gybing. In a strong breeze give the order "Down mainsail" and lower the mainsail. |
| (e) *Shift over the sheets.* | Given when wind is aft. Stand by to haul sheets aft on new side. |
| (f) *Down mainsail.....* | Given when wind is a little on the new weather quarter. Set mainsail and haul aft main-sheet, leave fore-sheet flying or smother sail into the mast, so boat's head will come up rapidly. |

| COMMAND. | DUTIES. |
|---|---|
| (g) *Haul aft fore-sheet*.. | Given as boat comes by the wind on the new tack. Haul aft fore-sheet and trim both sails. |

**4. To Heave-To.**

Heaving-to is not practicable unless there is a jib. In this case the evolution is performed as described for the sliding gunter, except that instead of "Up foresail" the order is "Down foresail."

**5. To Reef Sail.**

| | |
|---|---|
| (a) *Stand by to reef*.... | Given as a warning to the crew to prepare for the evolution. Tend halliards. Prepare earings and reef points. The coxswain brings boat by the wind in order to retain headway and keep the boat under control while reefing. |
| (b) *Reef sail*..... | The coxswain luffs slightly. Halliards are slacked down just enough to pass reef earings and reef points. Secure reef earings and pass reef points around *foot* of sail, not around boom. |
| (c) *Make sail*..... | Given when ready. Men at halliards hoist sails and coxswain lays the boat on the desired course. When a boat begins to take water it is time to reef. She should never even in smooth water be allowed to heel too much. |

**6. To Shake Out Reefs.**

| | |
|---|---|
| (a) *Stand by to shake out reefs.* | Given as a warning to to the crew to prepare for the evolution. Tend all halliards. Coxswain brings the boat by the wind. |
| (b) *Shake out reefs*.... | Coxswain luffs slightly. Halliards are slacked down just enough to cast off earings and reef points. |
| (c) *Make sail*..... | Men at halliards hoist sails and coxswain lays the boat on the desired course. Keep boat under control at all times. |

**7. To Shorten Sail. (As for a Heavy Squall.)**

| | |
|---|---|
| (a) *Stand by to shorten sail.* | Given as a warning for the crew to prepare for the evolution. Tend halliards. The coxswain lays boat by the wind. |

COMMAND. DUTIES.

(b) *Shorten sail*.....The coxswain luffs. The yards are lowered. Crew await next command, which may be either to make sail or to furl sail.

### 8. To Take In Sail.

(a) *Stand by to shorten sail.*

(b) *Shorten sail*.....Proceed as described above for this evolution.

(c) *Furl sail*.....Cast off fore tack and jaws of main-boom. Starboard thwartmen unhook and furl mainsail, using the sheets as gaskets; similarly, the port thwartmen unhook and furl foresail.

(d) *Stand by to unstep*..Cast off shrouds. Starboard thwartmen prepare to receive the mainmast; port thwartmen prepare to receive foremast.

(e) *Unstep* .....The bow and stroke oarsmen seize their respective masts and lift them vertically until they are clear of the thwarts, at the same time inclining them in the proper directions. They are then lowered, foremast on port side, mainmast on starboard side. Men amidships standing on bottom boards to receive and stow them. The crew then place foresail and mainsail along their respective masts, lash them with the shrouds, and quickly take their seats on the thwarts.

## CHAPTER II.

# SAILING LAUNCHES.

## DRILL FOR 50-FOOT MOTOR SAILING LAUNCH.

By Lieut. Commander G. C. Pegram, U. S. Navy.

**1. The Drill for the 50-Foot Motor Sailing Launch is Based on a Crew of 12 Men and a Coxswain.**

The station bill on page 21 gives in a condensed form the individual duties of each member of the crew for various evolutions.

For evolutions under sail, coxswain is at tiller in charge of boat and gives commands:

No. 1 is in charge of jib and forecastle and mans or tends jib halliards; reports when jib is ready.

No. 2 tends and mans jib downhaul.

No. 3 clears foremast rings in making sail; hauls down on rings in shortening sail; acts as bowman when alongside dock or vessel and as lookout underway.

No. 4 is in charge of foremast detail; clears mainmast rings in making sail and hauls down on rings in shortening sail; tends fore-sheet; reports when fore is ready.

No. 5 mans and tends throat-halliards (fore).

No. 6 mans and tends peak-halliards (fore); assists on jib-sheet, when necessary.

No. 7 tends jib-sheets.

No. 8 is in charge of mainmast detail and tends main-sheet; reports when main is ready.

No. 9 mans and tends throat-halliards (main).

No. 10 mans and tends peak-halliards (main).

No. 11 tends main-boom topping lift and assists No. 10.

No. 12 acts as stern man when alongside dock or vessel; assists No. 8 on main-sheet.

Note.—All gear must be kept clear for running at all times. As soon as one evolution is completed the gear must be neatly laid up immediately. Men in charge of parts of boat shall see this carried out.

## STATION BILL.

### FORECASTLE DETAIL, THREE MEN.

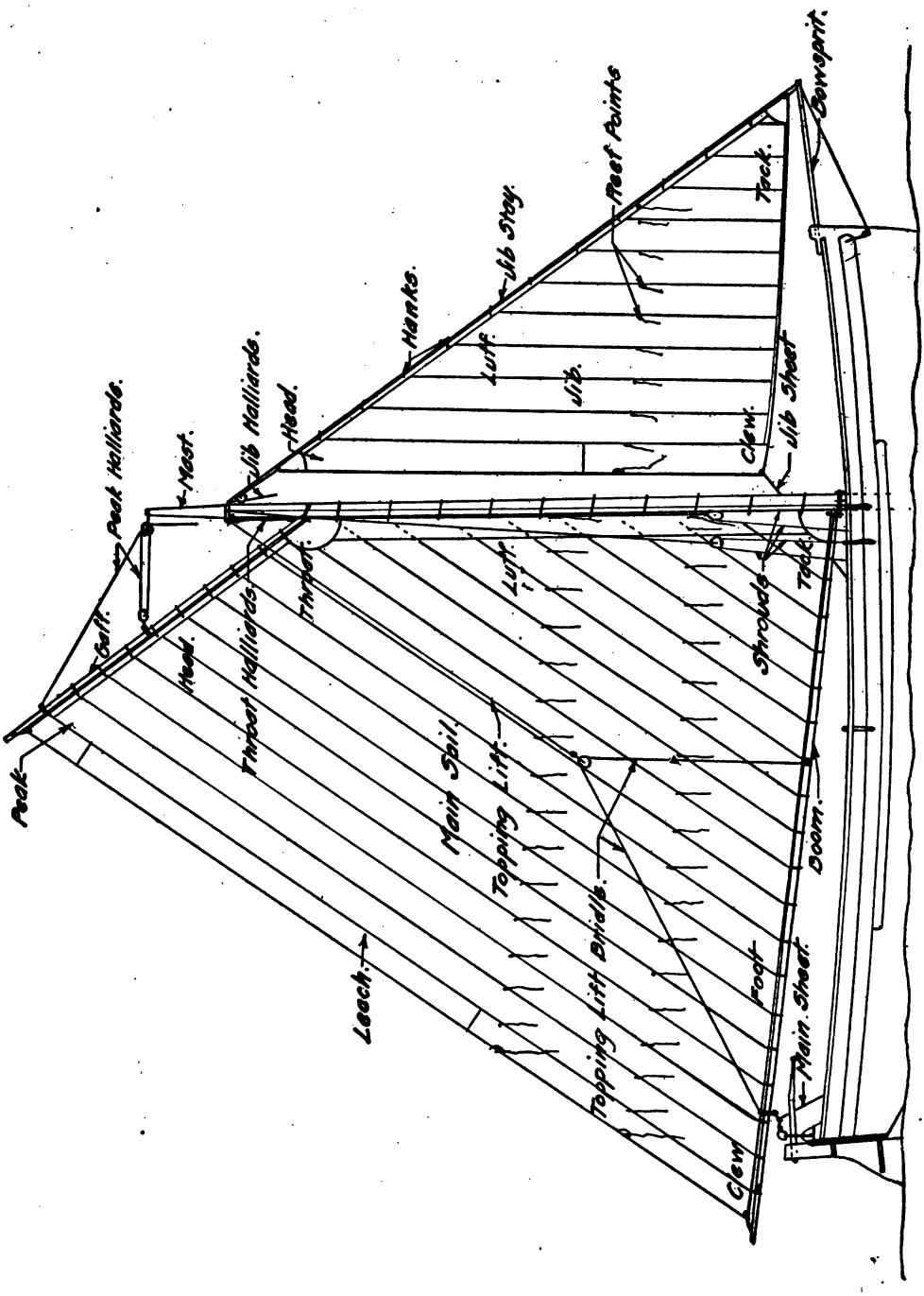
| No. | Loosing and making sail. | Dowsing and furling sail. | Reefing and shaking out reefs. | Unstepping and stepping masts (special duties). |
|---|---|---|---|---|
| 1..... | In charge forecastle. Man jib halliards. | Let go jib halliards. Furl jib. | Jib halliards. Pas earing and points. Shake out. | Rig jib halliards. Come up jib-stay. Tend and man jib halliards. |
| 2..... | Clear away jib. Tend downhaul. | Man jib downhaul. Pass jib gasket. | Pass tack lashing and points. Shake out same. | Assist No. 1. |
| 3..... | Lookout and bowman. Clear foremast rings. | Lookout and bowman. Foremast rings. Furl jib. | Lookout. Pass reef points. Shake out same. | Assist No. 1. |

### FOREMAST DETAIL, FOUR MEN.

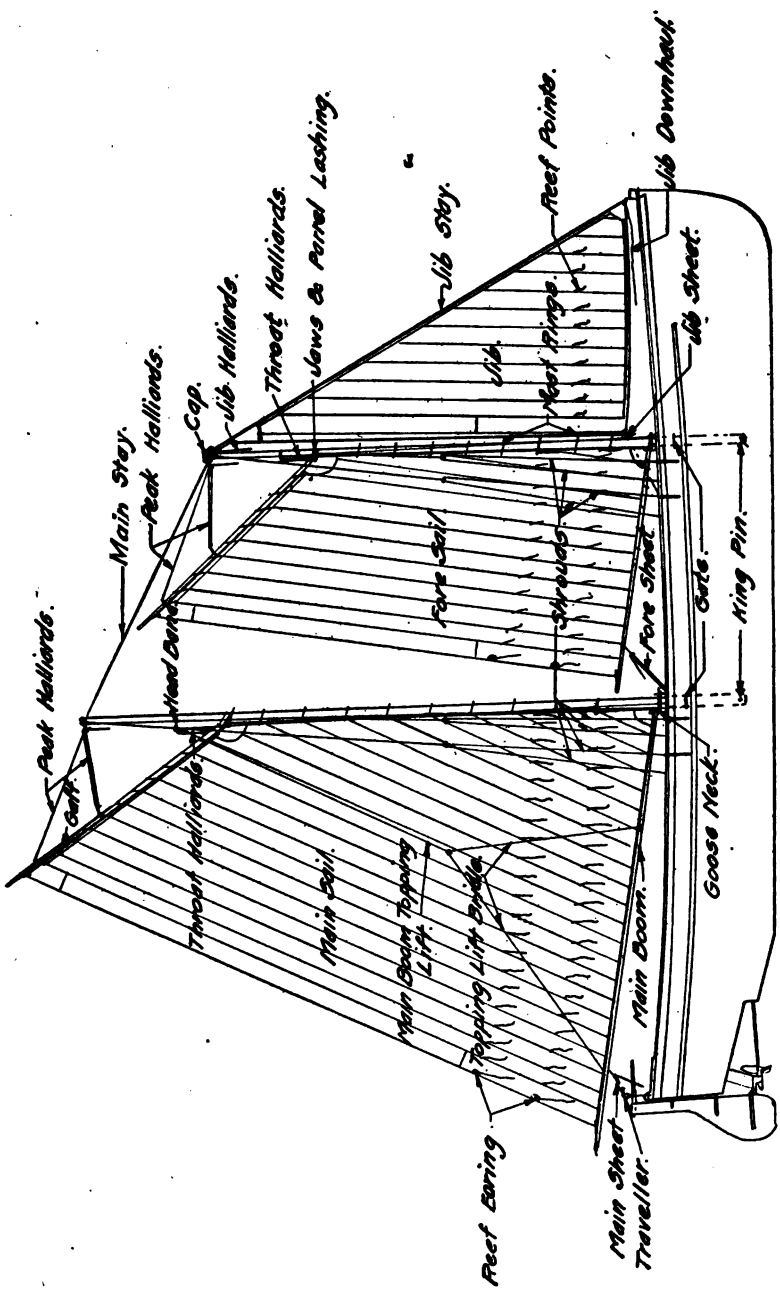
| | | | | |
|---|---|---|---|---|
| 4..... | In charge at fore. Clear away sail. Tend fore-sheet. Clear mainmast rings. | Tend fore-sheet. Mainmast rings. Furl foresail. Pass gasket. | Fore-sheet. Pass reef earing and points. Shake out. | Shift fore-sheet to port cleat. Open and close fore gate. Unship king pin. |
| 5..... | Man throat-halliards. | Slack away throat-halliards. Furl foresail. | Throat-halliards. Pass tack lashing and points. Shake out. | Unship fore gooseneck. Come up parrel lashing. Tend port fore-shrouds. |
| 6..... | Man peak-halliards. | Slack away peak-halliards. Furl foresail. | Peak-halliards. Pass and shake out points. | Tend and man mainstay. |
| 7..... | Pass aft and tend both jib-sheets. | Tend and secure jib-sheets. Furl foresail. | Tend jib-sheets. | Tend starboard fore-shrouds. |

### MAINMAST DETAIL, FIVE MEN.

| | | | | |
|---|---|---|---|---|
| 8..... | In charge at main. Cast off after gasket. Tend main-sheet. | Tend main-sheet. Furl mainsail. Pass after gasket. | Pass earing and points. Shake out same. | *Unship gooseneck.* Come up parrel lashing. Open main gate. Unship king pin. |
| 9..... | Cast off forward gasket. Man throat-halliards. | Slack away throat-halliards. Furl mainsail. Pass forward gasket. | Throat-halliards. Pass tack lashing and points. Shake out. | Shift lower block throat-halliards to bowline in stern fast. Tend throat-halliards. |
| 10.... | Man peak-halliards. | Slack away peak-halliards. Furl mainsail. | Peak-halliards. Pass points. Shake out same. | Tend peak-halliards and take weight of sail until gooseneck is unshipped. |
| 11.... | Tend main-boom topping lift. Assist No. 10. | Tend main-boom topping lift. Furl mainsail. | Tend topping lift. Pass points. Shake out same. | Come up topping lift, putting figure 8 knot in end. Tend starboard main-shrouds. |
| 12.... | Sternman. Assist No. 8. | Sternman. Assist No. 8. Furl mainsail. | Tend main-sheet. | Unhook lower block of main-sheet from traveller. Tend port main-shrouds. |
| Cox.. | At tiller. | At tiller. | At tiller. | Commands. In charge of boat. |




30- AND 40-FOOT SAILING LAUNCH. SLOOP RIG.




50-FOOT MOTOR SAILING LAUNCH. SCHOONER RIG.

### 2. Loosing and Making Sail. (Masts Being Stepped, Sails Bent.)

| COMMAND. | DUTIES. |
|---|---|
| (a) *Loose sail*..... | Clear away sails. No. 1 shifts standing part of jib halliards from clew to head of sail. Man all halliards; tend jib downhaul, all sheets and main-boom topping lift; stand by to clear mast rings. |
| (b) *With starboard (or port) sheet, make sail.* | Coxswain lays boat on desired course. Men stationed on halliards hoist away smartly, hand over hand, keeping gaffs horizontal until sails are all the way up. Clear mast rings. Nos. 10 and 11 must see that peak of mainsail does not foul bridle of topping lift, especially when making sail on port tack. |

### 3. Dowsing and Furling Sail.

| | |
|---|---|
| (a) *Stand by to shorten sail.* | Given as a warning for crew to stand by their stations. Man jib downhaul; tend all halliards; take in slack of main-boom topping lift; stand by to haul down on mast rings and on leech of mainsail (No. 12). |
| (b) *Shorten sail*..... | Slack away halliards roundly, keeping gaffs in horizontal position; haul down jib; haul down on mast rings and leech of mainsail; trim sheets in. No. 3 gathers in jib to keep it from going overboard; sails must be kept in the boat. |
| (c) *Furl sail*..... | Belay fore- and main-sheets, haul aft and belay port jib-sheet. Haul taut and belay jib downhaul. In furling, haul all sail and dog's ears over to port side of booms (opposite to that on which main-boom topping lift is secured). Furl jib, fore, and mainsails in same direction. Pass in leech of sail taut along boom; begin at lowest part and roll sail up neatly, stowing all earings, etc., inside, and make a taut skin. Pass gaskets so that they will tend to haul sail *on top* of boom. Unhook sister hooks of jib halliards from head of sail; hook one hook in clew and place other hook over jib-stay; haul taut halliards and belay, tricing sail up along jib-stay. Haul taut and belay both jib-sheets. See all gear hauled taut and neatly laid up or flemished down. |

### 4. To Tack.

| COMMAND. | DUTIES. |
|---|---|
| (a) *Ready about*..... | Given as a warning for the crew to prepare for the evolution. The coxswain gives the boat a good full, waits for a smooth time, then *eases* down the tiller. At the same time the man tending the main-sheet hauls the main-boom amidships slowly. |
| (b) *Ease off the jib-sheet.* | Given when jib begins to shiver, never before. |
| (c) *Let go fore-sheet*... | Given when foresail ceases to draw. |
| (d) *Shift over main-sheet.* | When wind is ahead, shift over the main-sheet. |
| (e) *Haul aft fore- and jib-sheets.* | As soon as the bow of the boat has passed the wind, haul aft fore- and jib-sheets, leaving the main-sheet slack until boat is well around, then trim by the wind. |

**Note on Tacking.**—The boat should be *sailed* around and not jammed into the wind and backed around. To do this the tiller must be eased down slowly and the main-boom hauled amidships very slowly, but not across the midship line for it will then act as a back sail. In a light breeze the boat will appear inclined to stop head to wind, due to the drag of the propeller. If this occurs, haul aft the new weather jib-sheet. This will be taken aback and will pay her head around. If the boat gathers stern board shift the tiller. In a gentle to moderate breeze the boat will tack without backing the jib. If, after having gotten around, the boat falls off too far from the wind, flow the jib-sheet, ease off fore-sheet, and sail her up to the wind, hauling sheets aft slowly. If sheets are hauled flat aft immediately the boat will lose ground to leeward. When nearly high enough, haul aft the jib-sheet and trim by the wind.

### 5. To Wear.

| | |
|---|---|
| (a) *Stand by to wear*... | Given as a warning for the crew to prepare for the evolution. The coxswain puts the tiller up when ready. |
| (b) *Ease off main-sheet*. | Given as her head pays off in order to get the maximum effect of the mainsail in keeping headway. The fore- and jib-sheets are kept fast as they help to pay off her head. |
| (c) *Ease off fore- and jib-sheets.* | Given when wind is a little abaft the beam. The sheets are slacked slowly in order to give headway. |

| COMMAND. | DUTIES. |
|---|---|
| (d) *Down main peak*... | Given when wind is nearly aft. Slack peak-halliards until gaff is perpendicular to mainmast. *Main-sheet must be rounded in rapidly.* |
| (e) *Shift over sheets*... | Given when wind is aft. Stand by to haul all sheets aft on the other side. |
| (f) *Up main peak*..... | Given when main-boom has been gybed and wind is on new weather quarter. Set mainsail and haul sheet aft; leave other sheets flying so she will come up rapidly. |
| (g) *Haul aft fore- and jib-sheets.* | Given as she comes by the wind on new tack. Trim both sheets aft, but not too flat. |

### 6. To Reef Sail.

| | |
|---|---|
| (a) *Stand by to reef*... | Given as a warning for the crew to prepare for the evolution. Tend all halliards. Coxswain brings boat by the wind. |
| (b) *Slack down the halliards.* | Coxswain luffs slightly, but not enough to cause boat to lose headway. Throat, peak, and jib halliards are slacked sufficiently to bring the single reef points down to the boom. |
| (c) *Reef sail*..... | Secure tack lashing and then reef earing. In passing earing first take a *hauling out turn* to stretch the sail along the boom, then take a *holding down turn* around the boom and through the cringle. Pass reef points around foot of sail, never around boom. Men in charge of parts of boat report when ready. |
| (d) *Hoist away*..... | Men at halliards hoist sails, and coxswain lays the boat on desired course. Always keep boat under control while reefing. Reef when boat begins to take in water over lee rail or sooner if considered necessary. Never be afraid of reefing too soon. |

### 7. To Shake Out Reefs.

| | |
|---|---|
| (a) *Stand by to shake out reefs.* | Given as a warning for crew to prepare for the evolution. Tend all halliards. Coxswain brings boat by the wind. |
| (b) *Slack down the halliards.* | Coxswain luffs slightly, but not enough to cause boat to lose headway. Jib, peak-, and throat-halliards are slacked handsomely. |

| COMMAND. | DUTIES. |
|---|---|
| (c) *Shake out reefs*.... | Come up reef points first, then ease away earings and tack lashings together. Men in charge of parts of boat report when ready. |
| (d) *Hoist away*..... | Men at halliards hoist sails. Coxswain lays boat on desired course. |

**8. To Heave-to.**

| | |
|---|---|
| (a) *Stand by to heave-to.* | Given as a warning to the crew to prepare for the evolution. Coxswain brings boat by the wind and keeps tiller a-lee. |
| (b) *Haul main-boom amidships. Haul aft weather jib-sheet. Down fore-sail.* | These commands are given simultaneously and are obeyed by the men at their stations.<br>In heavy weather the foresail is dowsed. In light breezes the fore-sheet may be simply slacked off and the fore-peak dropped.<br>If bow falls off, slack away jib-sheet. If bow comes into the wind, ease tiller and slack away main-sheet.<br>In this condition boat should lie dead in the water, wind about abeam. |

**9. To Get Underway from "Heave-to."**

| | |
|---|---|
| (a) *Make sail*..... | Haul aft jib-sheet, hoist foresail or fore-peak if dropped, and haul aft fore-sheet; ease the tiller and ease off main-boom. |

**10. To Unstep Masts. (See Notes on Unstepping at End of this Section.)**

| | |
|---|---|
| (a) *Prepare to unstep*.. | Remove thwarts and place fore and aft, outboard; remove bottom boards in wake of heels of masts and provide marline spike and hammer for each mast. Unhook jib halliards from clew of jib and hook in ringbolt in eyes of boat, reeve hauling part of jib halliards through ringbolt and belay to samson-post. Come up jib-stay; come up fore- and main-shrouds, keeping one turn with them only; come up mainstay and keep it in hand, carrying it inboard to fore and aft line. Unship fore- and main-boom goosenecks, and swing fore-boom to port and main-boom to starboard side of their respective masts; come up fore- and main-gaff parrel lashings. |

| COMMAND. | DUTIES. |
|---|---|
| | Cast off main-boom topping lift, putting figure 8 knot in end so it will not unreeve; unhook lower block of main-sheet from traveller. Unhook lower block main throat-halliards and hook into bowline thrown in end of port stern fast; carry hauling part of throat-halliards aft and round-in, taking a light strain. |
| (b) *Stand by*..... | Come up starboard fore-shrouds and carry them inboard to center line; man mainstay, tend main throat-halliards and main-shrouds; prepare to open main gate. Forecastle and foremast details stand by to receive mainmast as it is lowered. |
| (c) *Unstep mainmast, ease away, haul down.* | Open main gate; ease away on main throat-halliards; haul down on mainstay; steady mast by tending main-shrouds, and lower it to starboard of foremast. Launch main-boom forward as mast is lowered, sliding hoops towards masthead. Lower mast until forward details can support it with their shoulders and then remove king pin. Place mast outboard on starboard side. |
| | The crew then take stations for unstepping the foremast. Tend jib halliards; carry starboard fore-shrouds outboard and take one turn through eyebolt, and tend both starboard and port shrouds to steady mast. Mainmast detail stands by to receive foremast. |
| (d) *Unstep foremast, ease away.* | Open fore gate; tend shrouds to keep mast in fore and aft line; ease away on jib halliards until mainmast detail can support mast on their shoulders. Remove king pin. Place mast outboard on port side. |

**11. To Step Masts.**

| | |
|---|---|
| (a) *Prepare to step masts.* | Place foremast on fore and aft line and see all gear clear. Reeve and tend shrouds; reeve and man jib halliards. |
| (b) *Step foremast*..... | Mainmast detail pick up foremast and place heel of mast in step. Put in king pin. Hoist away on jib halliards, tending shrouds; close fore gate. |

| COMMAND. | DUTIES. |
|---|---|
| | The crew then take stations for stepping mainmast. Come up starboard fore-shrouds and carry them to the center line. All hands pick up mainmast and place it ready for stepping with masthead to starboard of foremast. See all gear clear. Reeve and tend main-shrouds; reeve and man main throat-halliards; tend mainstay. |
| (c) *Step mainmast*..... | Forward detail pick up mast and place heel in step. Put in king pin. Tend shrouds and mainstay; hoist away on throat-halliards; close main gate. When masts are stepped, all hands turn to in their own parts and rig the boat. |

**Notes on Unstepping and Stepping Masts.**—The masts are unstepped in succession, mainmast first. The mainmast is lowered on the *starboard* side of foremast; this is why it is necessary to carry the mainstay and starboard fore-shrouds inboard to the center line. The main is lowered by hauling on the mainstay and using the main throat-halliards as an easing down purchase. The lower block of the throat-halliards is unhooked from the gaff and hooked into a bowline thrown in the end of the port stern fast. The throat-halliards are then rounded in and a strain is kept on the hauling part. The mainmast is steadied while being lowered by means of the shrouds. In order to keep the main-boom in the boat it is necessary to launch the boom forward while the mast is being lowered, sliding the mast rings along the mast towards the head. When unstepped, the mast is launched aft so that the head will be in the boat, and mast and boom are then placed outboard.

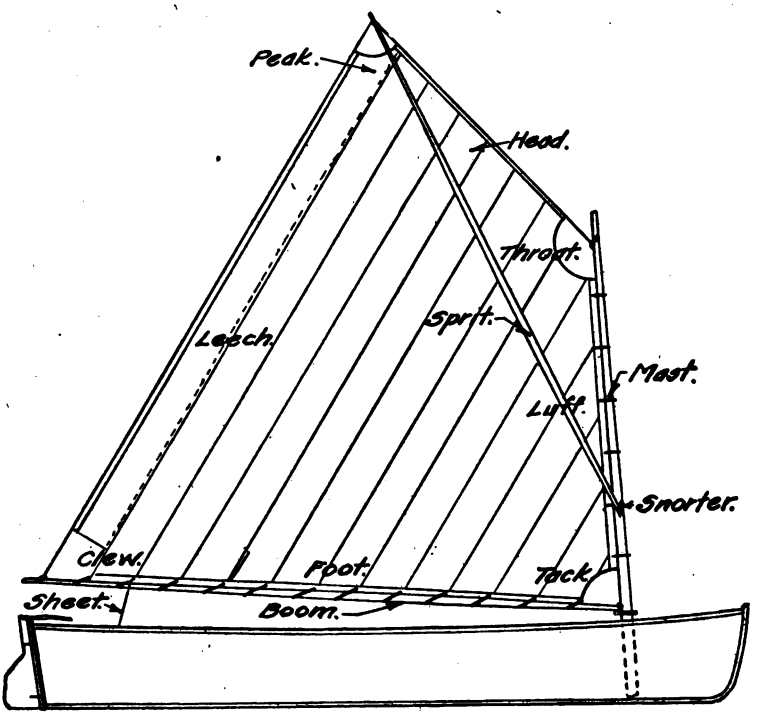
In lowering the foremast, the jib halliards are used as an easing-down purchase. The standing part of the jib halliards is hooked into the ring bolt in the bow and the hauling part is led through this ring bolt and belayed to the samson-post. While being lowered the foremast is steadied by means of the shrouds.

## CHAPTER III.

# SMALL BOATS.

## QUALIFYING FOR HANDLING SMALL BOATS.

Before a midshipman is permitted to take a boat out for pleasure during recreation periods, he is required to pass an examination before an officer of the Seamanship Department in order to demonstrate his ability to handle




20-Foot Dinghy. Sprit Rig.

small boats. This examination consists of two parts, oral and practical, and the following points are covered:

1. Rules of the Road for sailing vessels and small craft, pages 80-82, Deck and Boat Book.

2. Buoyage System in United States waters, pages 82-83, Deck and Boat Book.

3. Types and rigs of boats (Naval Academy).

4. Nomenclature of parts of boats and sails.

5. Gear used in handling sail, name and function of each piece.

6. How to steer and orders used in steering.

7. Orders used and how to loose sail, make sail, dowse sail, and furl sail.

8. When to reef, how to handle boat while reefing, orders used; how to pass reef earings and points; and how to shake out reefs.

9. How to tack and wear, orders used; how to handle rudder; and what to do at each successive step.

10. What is meant by "gybing," the attendant dangers or mishaps, and how these may be avoided.

11. The universal sailing rule.

12. What to do when hit by a sudden squall.

13. Dangers of running before the wind, and precautions to be taken.

14. What is meant by the following terms: "On the wind," "Close hauled," "Running free," "Full and by," "Starboard tack," "Port tack," "Beating to windward," "Luffing," "Coming about," "Trim of boat," "No higher," "Weather or lee tiller."

15. How to get away from and return to moorings.

16. The use of the General and Boat Recalls and where hoisted.

## CHAPTER IV.

# NOTES ON GROUND TACKLE.

### BRINGING SHIP TO ANCHOR.

When standing into port or nearing an anchorage call, *"Bring ship to anchor."*

If all hands are required, the *"Assembly"* is sounded on the bugle, otherwise the ship is brought to anchor by the watch.

The order for letting go is always preceded by, *"Stand clear of the starboard (or port) chain."*

The first lieutenant or officer of the forecastle is generally informed beforehand of the scope of chain desired and which anchor is to be let go; but after letting go the order is generally given to *"Veer to . . . . fathoms"* or *". . . . fathoms at the water's edge."*

When the first lieutenant reports that the specified scope of chain is out he is then ordered to *"Secure"* and when the chain is secured the order is given *"Pipe down."*

Before coming to anchor, steam should be turned on the anchor engine in order to be ready to heave in should the chain be veered beyond the desired scope.

### READY FOR LETTING GO.

An anchor is ready for letting go when the following conditions exist:

**Modern Anchor Housing in Hawse-Pipe (Case 1).**—Anchor is first housed in hawse-pipe, the wildcat is unlocked from the shaft and held by the friction brake and the controller block lifted (if fitted).

**Modern Anchor Housing in Hawse-Pipe (Case 2).**—Anchor housed in hawse-pipe, wildcat unlocked from the shaft and the friction brake slacked, the chain being held by the slip stopper.

**Old-Fashioned Anchor Secured on Bill-Board (Case 3).**—Anchor is held on the bill-board by ring stopper and shank painter, the wildcat unlocked from the shaft and the friction brake slack.

**To Let Go.**—When the order is given to let go, slack the friction brake (Case 1), trip the slip stopper (Case 2), or trip the releasing bar (Case 3). Veer to the required scope, keeping control of the chain by means of the friction brake. Never allow too much strain to come on the chain, nor allow the chain to veer in a bight on top of the anchor.

**Anchor Buoy.**—In case the chain parts, it is desirable to have an anchor buoy to show the location of the chain. These buoys are painted red for port anchor and green for starboard. The buoy rope is made fast around the crown of the anchor. In letting go, the buoy rope and buoy are stopped to the outboard side of the life lines with rope yarns which break when the

anchor is let go. A buoy is said to *watch* when it floats on the surface. Often in a tideway the anchor buoy does not watch. Metal buoys often leak and lose buoyancy, in which case the order is given to bleed the buoy.

**To Secure After Anchoring.**—When order is given to secure, set up on friction brake, pass deck or slip stoppers, ease friction brake, allowing strain to come on stoppers, then set up again on friction brake.

## TO VEER CHAIN IN AN EMERGENCY.

The chain being secured as above when the order to veer is given, cast off the deck stoppers, see everything clear of chain, then slack friction brake until chain veers. When the desired scope of chain is out, set up on the friction brake, pass the stoppers and proceed as above to secure the chain. *All line officers should be thoroughly familiar with the details of veering chain.* It is often necessary to veer chain during a night watch when it comes on to blow. The officer of the deck has only the anchor watch to assist him so that he practically has to do the job himself.

## GETTING UNDERWAY.

When the order is received from the executive or captain to get underway the word is passed, *"All hands up anchor"* or *"Up anchor."* The officer of the deck orders *"Heave around"* when the signal for getting underway is hauled down. As the chain is hove in the officer of the forecastle (usually the first lieutenant) makes the following reports: *"Short stay, sir,"* when the scope of chain is slightly greater than the depth of water; *"Up and down, sir,"* when slack chain is hove in and the chain leads up and down from the hawse-hole to the anchor; *"Anchor is away, sir,"* when the anchor is clear of the bottom; *"Anchor in sight, clear (or foul) anchor,"* when the ring of the anchor comes in sight. When the anchor is up it is gotten ready for letting go immediately and the report made: *"Both anchors ready for letting go, sir."* The command *"Pipe down"* is generally given after the anchors are reported ready for letting go. When off soundings the order is given *"Secure both anchors for sea."*

## SECURING THE ANCHOR FOR SEA.

The anchor is generally secured for sea by passing two or three deck stoppers and also by a heavy slip stopper fitted with a turnbuckle and shackle to a ringbolt in the deck. The pelican hook passes through the jew's-harp or a link near it. Setting up on the turnbuckle rouses the anchor up tight in the hawse-pipe and keeps it from working. Some ships are fitted with a bar that spans the hawse-pipe and through this bar is a threaded rod with a hook which engages in the jew's-harp.

**Notes on Getting Underway.**—Have steam on the anchor engine and a man to run it in ample time so that the engine will be warmed up and ready when the word to *"Heave around"* is given. Notify the boatswain of the time of getting underway. Pass the word for chain tierers, see wildcat locked to shaft and see block of controller (if used) down. The controllers have been omitted from all modern ships, as it was found that in veering the controller wore away the chain. When turning over the main engines the officer of the deck should be on the bridge and the boatswain or reliable petty officer on the forecastle. *"Heave around."* Start the windlass. As the chain comes in link by link over the controller blocks it is inspected by two petty officers, who tap each link for flaws or cracks in the weld. (See United States Naval Instructions, 2631(3).)

In order to obviate the difficulty experienced in getting shackles over the wildcat in braking ground, some ships are fitted with patent shackles (*kenter*) which have the same shape as a link of chain, but are heavier. As the chain is hove in the officer of the deck often inquires *"How does the chain tend?"* The tend of the cable is the direction in which it leads, or is the angle made by the chain relative to the fore and aft line of the ship. The proper reply is *"Broad off the starboard bow, sir,"* or *"Across the ram, sir."* On many ships you will find that the officer of the deck is kept informed of the amount of chain out and the direction in which it tends by means of tin discs bearing the numbers 60, 45, 30, 15, etc., which are held in the hands of a specially stationed man on the forecastle. The number on the disc shows the amount of chain out, and the direction in which he points his arm is the tend of the chain. Other ships have dials with pointers giving the same information. These devices obviate the reports made by the officer of the forecastle. It is very important in heaving in or veering not to bring a heavy strain on the chain. Such an undue strain may not be evident at the time, but the chain might be strained to such an extent that it would part when subjected to another strain. It is for this reason that the officer of the deck should go to the bridge when testing the main engines and station the boatswain or a reliable petty officer on the forecastle to report when any strain comes on the chain. When the anchor is up, pass deck or slip stopper, unlock wildcat, set up on friction brake and get the anchor ready for letting go.

## DUMMY WILDCATS.

These are wildcats of same design as other wildcats, but are not connected to the anchor engine. They are used for controlling sheet chain when letting go. In order to heave in, the chain must be thrown off the dummy wildcat and over one of the bower wildcats, first throwing off bower chain.

## CHAPTER V.

# MOORINGS OF A SHIP ALONGSIDE A DOCK.

### NOMENCLATURE.

When a ship is *moored to a dock* all the lines and chains by which she is secured are collectively spoken of as *moorings.*

Moorings include:

(a) **Inshore Moorings.**—(Always used):

*Bow line* (Sometimes called *bow fast*). Always used.

*Springs.*
- Forward bow spring, After bow spring } Generally used.
- Forward waist spring, After waist spring } Sometimes used.
- Forward quarter spring, After quarter spring } Generally used.

*Breasts.*
- Bow breast. Always used.
- Waist breast. Sometimes used.
- Quarter breast. Always used.

*Stern line* (Sometimes called *stern fast*). Always used.

(b) **Offshore Moorings.**—(Sometimes used):

*Bow mooring.*
*Bow breast mooring.*
*Quarter breast mooring.*
*Quarter mooring.*

Inshore moorings (a) are provided by the ship or are provided on the dock by the navy yard. Offshore moorings (b) are chains from offshore anchors and are used only for the moorings of a permanent ship like a station ship.

### DESCRIPTION.

After bow springs and after quarter springs lead aft, and check the ship against going ahead.

Forward bow springs and forward quarter springs lead forward, and check the ship against going astern.

Bow breast and quarter breast are used to haul the ship broadside to the dock and hold her.

The ends of hawsers are made fast on the dock to *bollards, piles, ring bolts,* or *cleats.*

Hawsers are secured on board ship to *bitts* and lead through *chocks* to give them a fair lead.

*Bow Line.*—May be of wire, manila, or chain, led through the bow towing chock or through the warping chock on the forecastle, and made fast to piles or bollards on the dock well ahead of the ship. Used to haul the ship ahead and hold her.

*Stern Line.*—May be of wire, manila, or chain, led through stern towing chock or quarter chock on the after deck; led well aft on the dock and made fast to piles or bollards. Used to haul the ship astern and hold her.

*Forward Bow Spring.*—Led through chock anywhere on forecastle between bridge and stem. Leads forward, checks ship against going astern and holds her.

*After Bow Spring.*—Led through chock anywhere on the forecastle between the stem and bridge. Leads aft, checks ship against going ahead and holds her.

*Forward Quarter Spring.*—Led through any chock on the after deck between the after turret and stern. Leads forward, checks ship against going astern and holds her.

*After Quarter Spring.*—Led through any chock on the after deck between the stern and after turret. Leads aft, checks ship against going ahead and holds her.

*Bow Breast.*—Led through any chock on the forecastle between bow and bridge. Leads at right angles to keel line of the ship.

*Quarter Breast.*—Led through any chock on the after deck between the after turret and stern. Leads at right angles to the ship's keel line. Both breasts are used to haul the ship broadside to the dock and hold her.

If a large battleship moored to a dock should have breast and springs out between bow and quarter, they would be called *waist breast, forward waist spring,* and *after waist spring.*

*Spur Shores.*—To hold a ship clear of a dock. They are wooden spars, from 30 to 50 feet in length with a mean diameter of about 20 inches. Each fitted at one end (the inner or shore end) with *trucks,* and a *half chock* (for the *heel chains*) and *ring bolts,* and at the outer or ship end with three ring bolts for the lashings to secure it to the ship's side.

*Spur Shore Shoe.*—Made of plank from 3 to 4 inches thick and $2\frac{1}{2}$ to $3\frac{1}{2}$ feet square, scored out a little on one side to take the ship end of the *spur shore,* and fitted with ring bolts to lash it to the ship's side.

*Thrum Mat.*—To protect the ship's side, placed between the *spur shore shoe* and ship's side.

NOTE.—In unarmored ships be careful to place the spur shore shoe on the ship's side where a frame will take up the pressure of the spur shore, otherwise the plates may be dished in.

*Spur Shore Heel Chains.*—Made fast to *bollards, ring bolts,* or *cleats* on the dock, on each side of the *spur shore.* The bight is placed in the *half chock* at the heel of the *spur shore.* They keep the *spur shore* in place after the ship is shored (or breasted) out as far as desired from the dock.

*Camels.*—Rectangular floats built of wood, anywhere in size from 20 x 10 x 2 feet to 40 x 20 x 4 feet, are sometimes fitted with hemp or manila *puddings* or *fenders* at the corners. The *camels* float between the ship and the dock, rising and falling with the tide; and take the place of *spur shores* in keeping the ship clear of the dock.

*Fender Spars.*—Used in some navy yards in place of *camels.* (Spars and camels are not good for vessels having low scupper lines.)

*Brows.*—Portable wooden bridges hoisted on board from the dock. Communication is had with the shore and the ship over the *brow.* They are from 20 to 60 feet in length and from 4 to 8 feet wide, fitted with trucks at both ends and in the middle.

*Chocks.*—Made of metal and fitted to the ship's rail or over the waterways, to give a fair lead to hawsers. (Chocks have horns and a base, and are secured with through bolts).

*Bitts.*—On board ship are made of metal. To them hawsers are secured when lying alongside of a dock.

*Bollards or Dolphins.*—Upright wooden or iron posts on the dock to which a vessel's lines are secured when alongside a dock (some docks are fitted with *cleats* and *ring bolts*). An old smooth-bore gun sunk in a dock with the muzzle half up is called a bollard.

*Cleats,* iron, are fitted on board ship and on docks for securing lines. Cleats have horns and a base, and are through bolted.

*Ring Bolts.*—To make a mooring hawser fast to a ring bolt, put chafing gear on the line, take a round turn and two half hitches. To double the mooring at a ring bolt, shove the bight of the line through the ring and shove a toggle through the bight.

*Mooring Staples.*—Large iron staples fitted to the ship's side about 4 or 5 feet above the water line. Mooring chains found at most navy yard docks are rove through them and sometimes take the place of the manila *springs* and *breasts.*

*Fender Piles.*—Large spars driven into the bottom of a river or bay at the corners of docks for the ship to take up against.

*High Tide.*—Moor taut, have all lines taut.

*Low Tide.*—Moor slack, and allow for the rise of the tide.

*Bow Towing Chock.*—Largest pair of chocks over the stem in the bows.

*Stern Towing Chock.*—Two large round chocks over the stern.

*Hawsers* that lead down to a dock at an acute angle to a bollard or pile without a *norman* should be secured with a round turn and two half hitches; other-

wise when the strain comes on the hawser, the end would jump off, as would be the case with a bow line or an eye in the end of the hawser.

*Chafing Gear.*—Old canvas parcelled then frapped over the parts of hawsers to protect hawsers from wear by chafe. (In using chafing gear be sure it is on the part which is to be protected.)

*Frapping.*—Old rope strands frapped over the parcelling to bind it to the hawser.

## GETTING READY TO GO ALONGSIDE A DOCK.

(a) On the forecastle clear for running:

1—Bow line, 9-inch manila or 5-inch wire hawser.
1—Spring, 6- or 7-inch manila. (The two ends become the forward and after bow springs.)
1—Breast, 5- or 6-inch manila hawser.
6—Heaving lines.
4—Cork fenders.

(b) On the after deck clear for running:

1—8-inch manila or a 4½-inch wire hawser, for stern line.
1—Spring, 7-inch manila hawser. (The two ends become the forward and after quarter springs.)
1—Breast, 5- or 6-inch manila hawser.
6—Heaving lines.
4—Cork fenders. (Four cork fenders are also kept handy on the superstructure or in the waist, in case they should be required amidships.)

See that all is clear on the side going towards the dock.

The best method is to give numbers to the lines which are primarily used to place the ship, each division being assigned to duty with its own numbered line, and the division officer having the responsibility of using his line for a definite purpose. In the *Delaware,* for example, there were six deck divisions:

1. One division looked out for No. 1 line—the bow line.
2. One division looked out for No. 2 line—the bow breast.
3. One division looked out for No. 3 line—the after bow spring.
4. One division looked out for No. 4 line—the forward quarter spring.
5. One division looked out for No. 5 line—the quarter breast.
6. One division looked out for No. 6 line—the stern line.

After the ship is placed alongside the dock, and temporarily made fast with her manila lines, the *brows* are gotten on board and secured, the *bow* and *stern lines* are replaced by wire hawsers (unless they were used in the first place), and all *springs* and *breasts* are doubled up and chafing gear placed on the lines in wake of all chocks, string pieces, and other places where they are liable to become chafed. If there are plenty of good mooring chains on the dock, they are rove off through the *mooring staples,* or taken up through the *chocks*

on the rail and secured to the *bitts,* using hook ropes to get them through the *mooring staples* or on deck. Care is taken to have *check hook ropes* on the chains when hauling them through the staples or on board, otherwise they might take charge and run overboard or hurt some one. The mooring chains through the bow mooring staples are called the forward bow spring chain, after bow spring chain, and bow breast chain, the names are the same as if they are taken on deck. The chains through the quarter mooring stables are called the forward quarter spring chain, after quarter spring chain, and quarter breast chain. Mats are hung on the side where the *spur shores* are to take against the *spur shore shoes,* and on the mats the *spur shore shoes* are secured, the ship ends of the *spur shores* are then hauled up and placed in the *score* of the shoes and secured, the *spur shore heel chains* are then taken around the heel and placed in the half chock on top of the spur shore; the ends of the chains hauled taut with tackles, and when the ship is spurred (or breasted) out as far as desired the heel chains are secured either to *cleats, bollards,* or *ring bolts* on the string pieces of the dock, or in some cases taken over the string pieces and secured to the under piling of the dock.

In case spur shores are not provided, camels are floated (two or three) between the ship and the dock, to keep the ship clear of the dock.

At all navy yards, tugs bring the ship close enough to the dock to allow heaving lines to be thrown to the men stationed on the dock to receive the lines, they then haul the lines onto the dock and belay the ends to the bollards, cleats, or piles.

If there are no tugs available, boats are lowered, the lines run to the dock, and the ends secured to the bollards or piles.

## MAKING PREPARATIONS TO LEAVE THE DOCK.

All lines are *singled,* spring chains and breast chains unbent and hauled on the dock where they are neatly *faked down* alongside the bollards. Spur shores and brows are hauled ashore and laid in line with the string pieces, or fore and aft with the ship well clear from the ends of the dock; fenders are gotten ready for use with the tugs, and to fend off on the side towards the dock, where needed.

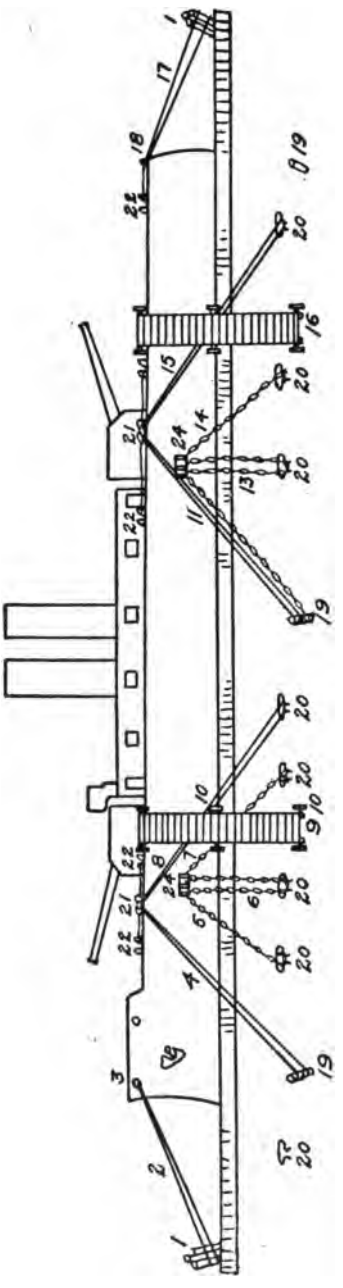
When clear of the dock all hawsers that are wet must be dried before reeling them up. (Never allow a hawser, manila or wire, to be stowed away wet.)

An officer of the deck being relieved would say to his relief, "The ship is secured to No. 2 dock with *bow* and *quarter springs* and *breasts* to the *mooring staples,* a 5-inch wire *bow line* three parts, a 4½-inch wire *stern line* four parts, with two *spur shores* and two *brows* aboard." Or, "The ship is secured at No. 5 dock with a 5-inch wire *bow line,* 8-inch manila *bow springs* and *breast,* 7-inch manila *quarter springs* and 6-inch manila *quarter breast,* well parcelled, a wire 4½-inch *stern line,* has two *camels* alongside, and two *brows* aboard."

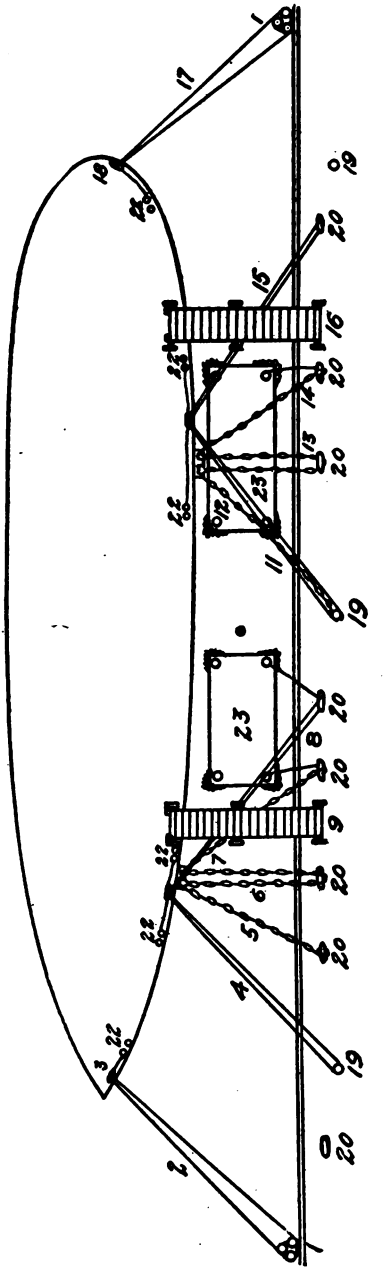
## EXAMPLE I.

A battleship moored alongside of a dock with mooring chains rove through the *mooring staples* and using *camels* to keep her off.

1. Piles.
2. Bow line (wire, 5-inch).
3. Bow or towing chocks.
4. Forward bow spring (wire, 4¼-inch).
5. Forward bow spring chain.
6. Bow breast chain.
7. After bow spring chain.
8. After bow spring.
9. Forward brow.
10. Brow trucks.
11. Forward quarter spring (wire or manila).
12. Forward quarter spring chain (through mooring staple).
13. Quarter breast chain (through mooring staple).
14. After quarter spring chain (through mooring staple).
15. After quarter spring (wire or manila).
16. After brow.
17. Stern line (wire, 4½- or 5-inch).
18. Stern or towing chock.
19. Bollards.
20. Cleats.
21. Chocks.
22. Bitts.
23. Camels.
24. Mooring staples.



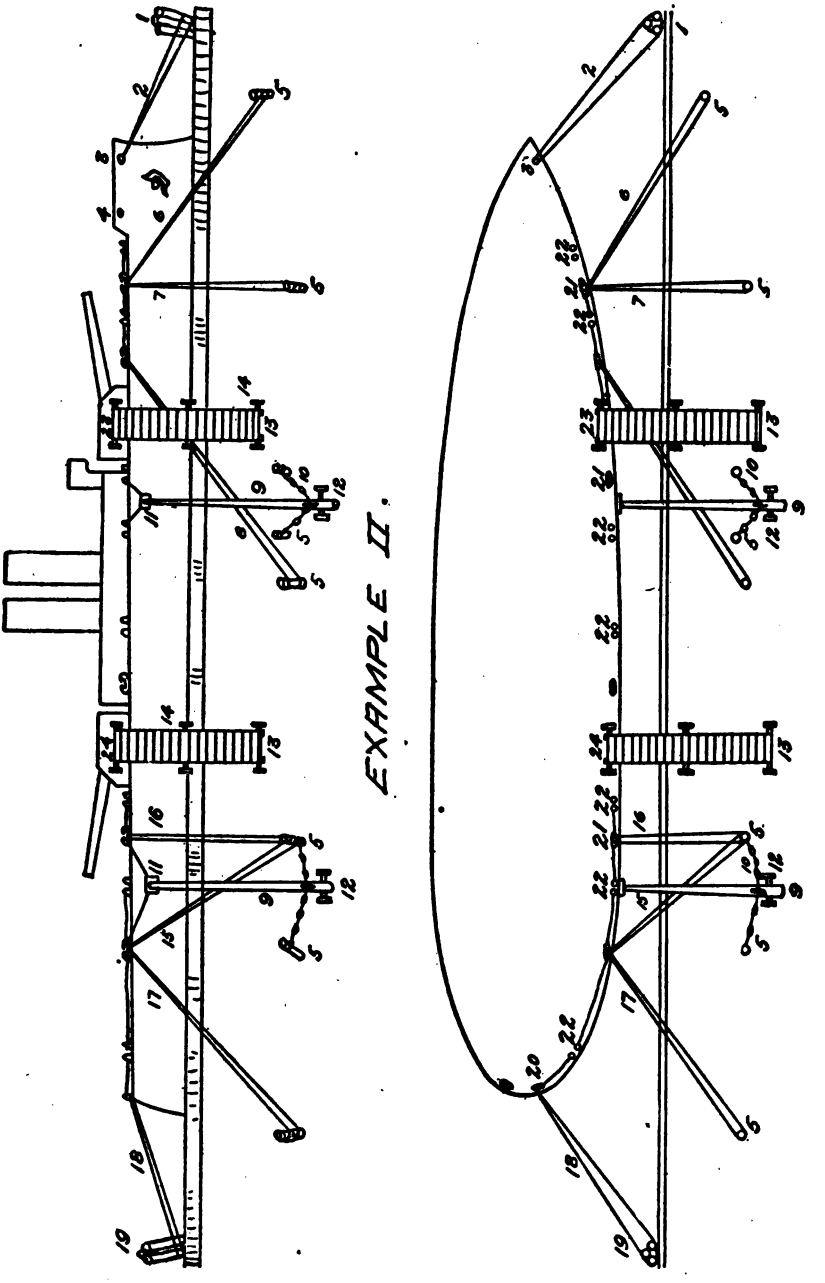
EXAMPLE I.



## EXAMPLE II.

Battleship moored to a dock with *spur shores* to keep her off.

1. Piles.
2. Bow line.
3. Bow or towing chock.
4. Warping chock.
5. Bollards.
6. Forward bow spring.
7. Bow breast.
8. After bow spring.
9. Spur shores.
10. Spur shore heel chains.
11. Spur shore shoe; a mat is placed between shoe and side.
12. Spur shore trucks.
13. Brow.
14. Brow trucks.
15. Forward quarter spring.
16. Quarter breast.
17. After quarter spring.
18. Stern line.
19. Piles or piling.
20. Stern or towing chock.
21. Chocks.
22. Bitts.
23. Forward brow.
24. After brow.

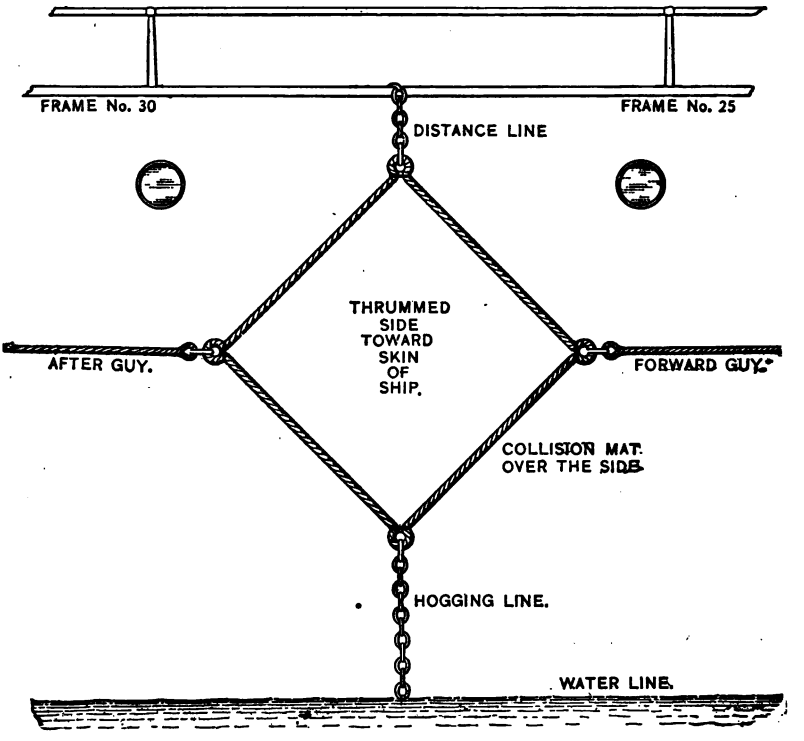


EXAMPLE II.

## CHAPTER VI.

## COLLISION MAT.

Collision mats are used to stop the inflow of water in case a vessel's bottom is injured in collision or otherwise. They are carried by all of our vessels of war, and regular drills are held to familiarize the crew with their use.




In the United States Navy there are five sizes as follows:

No. 1, 12 feet square, for ships.
No. 2, 10 feet square, for ships.
No. 3, 8 feet square, for ships.
No. 4, 6 x 4 feet, for torpedo-boats.
No. 5, 4 x 3 feet, for torpedo-boats.

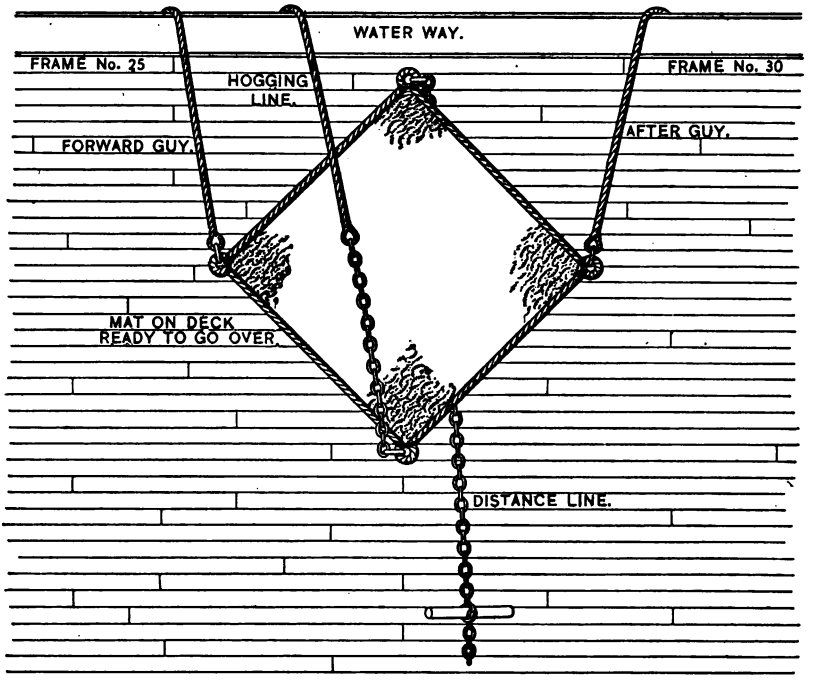
One thickness of canvas of the collision mat is usually *thrummed* and the thrummed side is placed toward the skin of the ship.

The mat is hauled out by the lines, as shown in the sketch.

The *hogging line* of wire rope tailed with chain is shackled to the lower corner of the mat, passes under the keel and is manned inboard on the

opposite side of the ship. The hogging line is passed under the keel by means of the *dipping line.* This is a small manila or hemp rope with a middle section of chain to make it sink quickly. The bight is passed over the stem and the ends carried aft on both sides until abreast the point of collision, when one end of the dipping line is made fast to the hogging line. It is customary in some ships at collision call to start a dipping line from aft as well as from forward and use whichever arrives first.

The *distance* or *lowering line* is usually of wire rope tailed with chain and is shackled to the upper corner of the mat. This line is usually marked in




fathoms and feet so that by consulting a blue print the mat can be lowered to any specified distance below the water line.

The forward and after corners of the mat are hauled out by the *forward and after guys.* These are usually of 4-inch manila and are secured to the mat by shackles. These lines should be long so that they can be led well forward and aft to get a good spread on the mat.

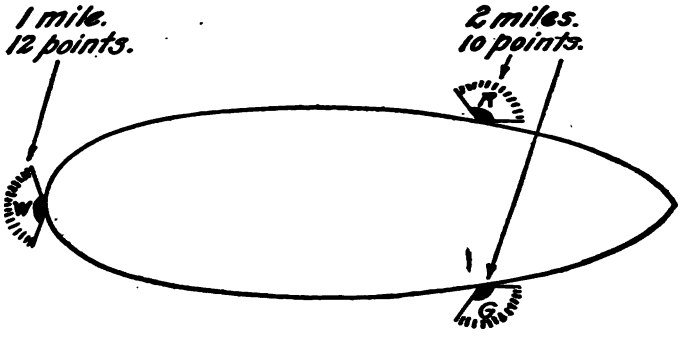
On some ships the frame spaces are marked on deck by numbers cut in the deck near the waterway. There will also be found brass plates in the waterways at various places giving the distances down to various openings in the ship's bottom, such as torpedo tubes, main injection, overboard discharge, etc.

## CHAPTER VII.

## RULES OF THE ROAD PERTAINING TO LIGHTS.

Sailing Vessel. (International)

Articles 1, 5, -10-12.




Inland Rules same except white light not restricted to 12 points.

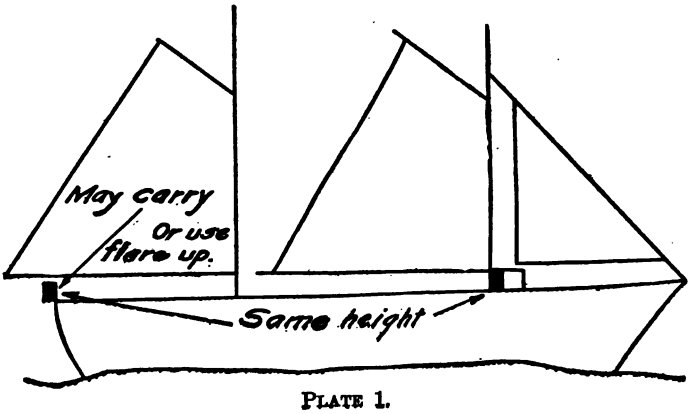
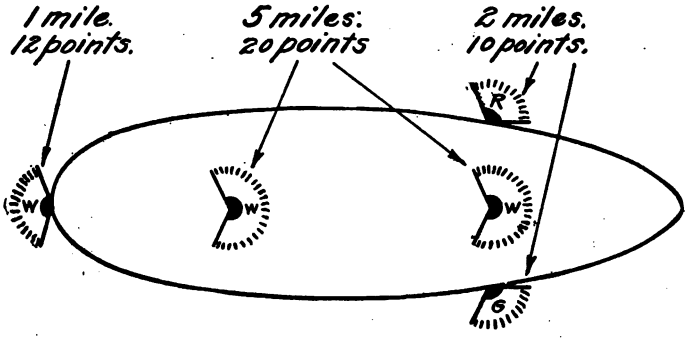



PLATE 1.

Sea Going Steamer (International and Inland).

Articles 1,-2,-a,-b,-c,-d,-e,-10-12.



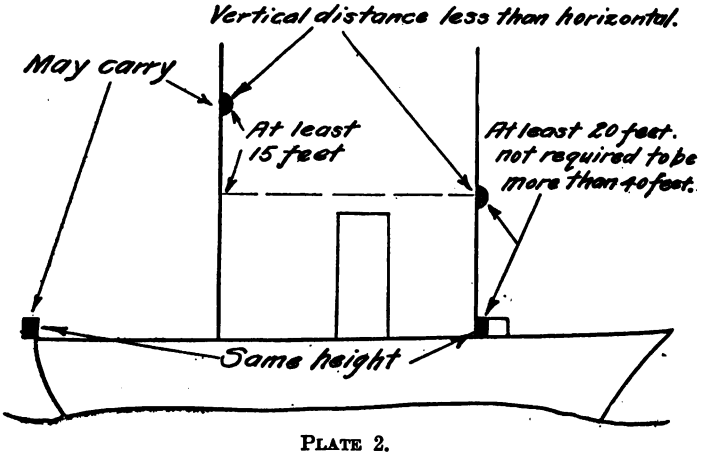
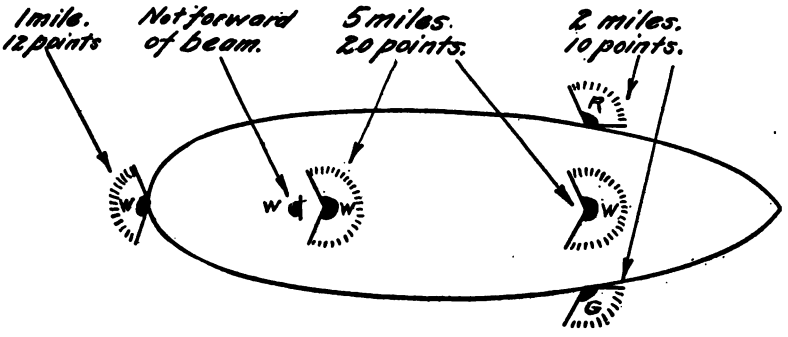




PLATE 2.

Sea-
Going Steamer Towing (International and Inland).
Articles 1,-2,-b,-c,-d,-e,-3,10,-12.



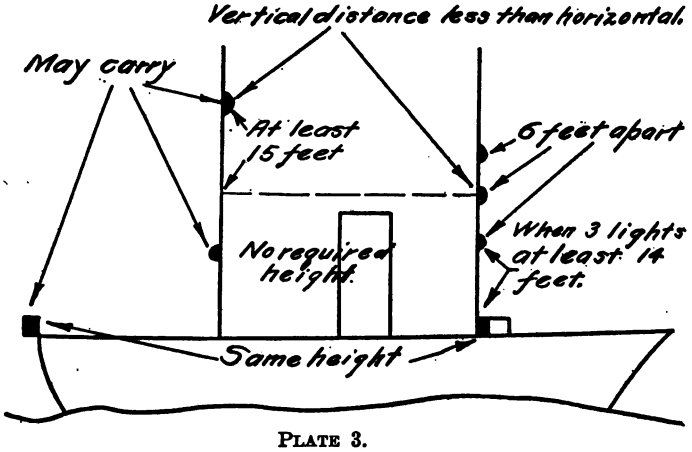
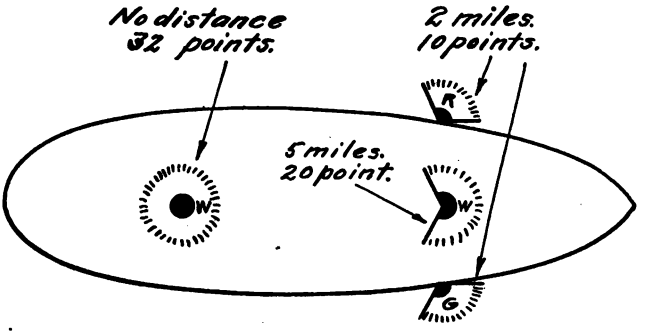




PLATE 3.

Non—
Sea Going Steamer, except ferry boats (Inland).

Articles 1,-2,-a,-b,-c,-d,-e,-f,-12.



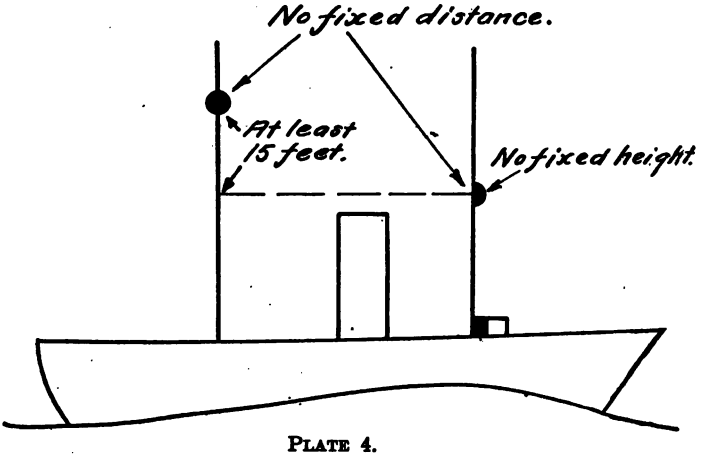
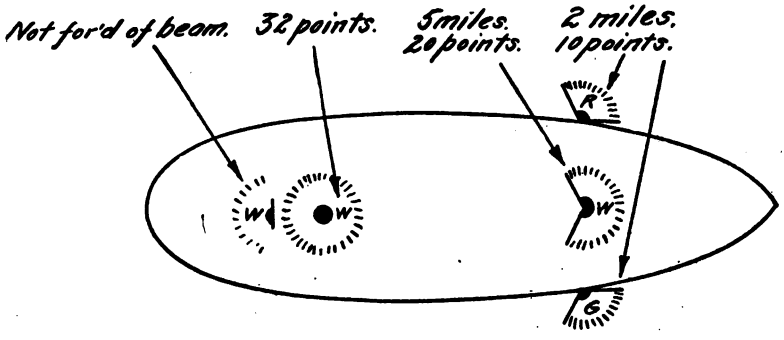




PLATE 4.

Non-
Sea Going Steamer Towing, except ferry boats. (Inland)

Articles 1,-2,- b,-c,-d,-e,-f, 3,-10,-12.



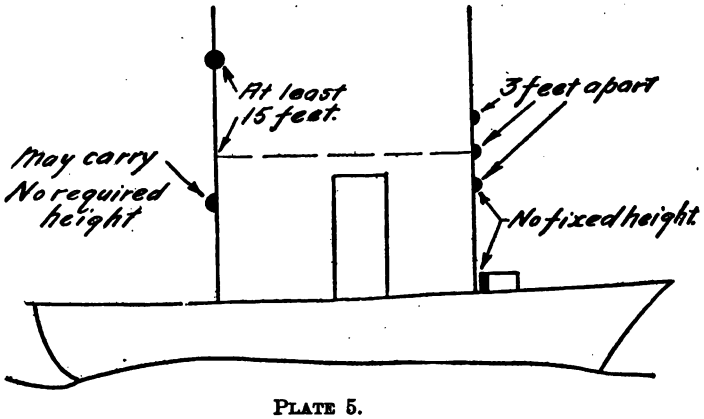
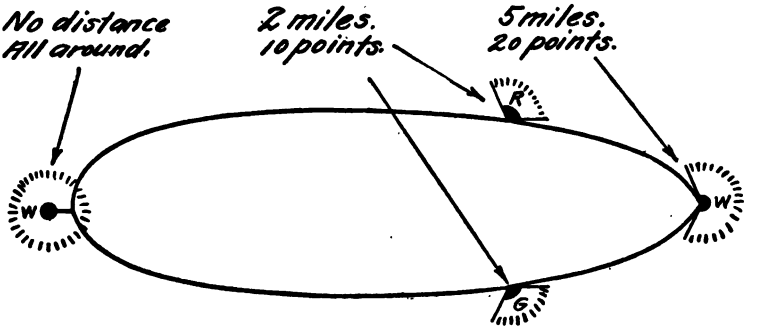




PLATE 5.

Non-
Sea Going Steamer, except ferry boats, (Inland).

Articles (Inland Rules) 1,-2,-a,-b,-c,-d,-e,-f,-12.

No foremast.



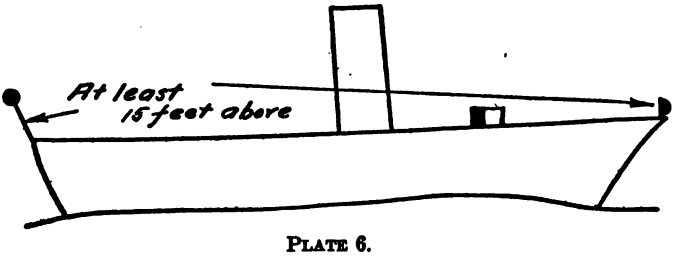
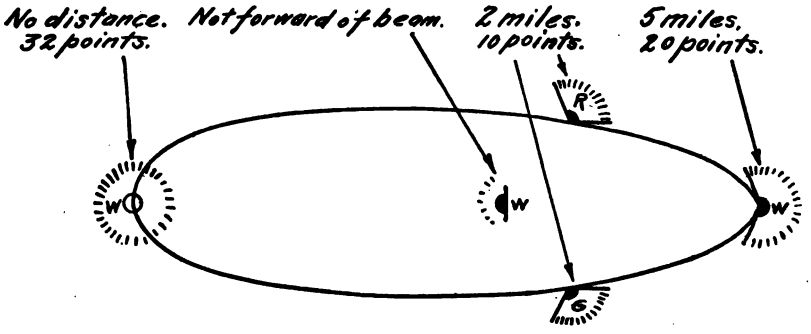




PLATE 6.

Non Seagoing Steamer Towing, except ferry boats, (Inland).

Articles (Inland Rules), 1,-2,-b,-c,-d,-e,-f,-3,-10,-12.

No foremost



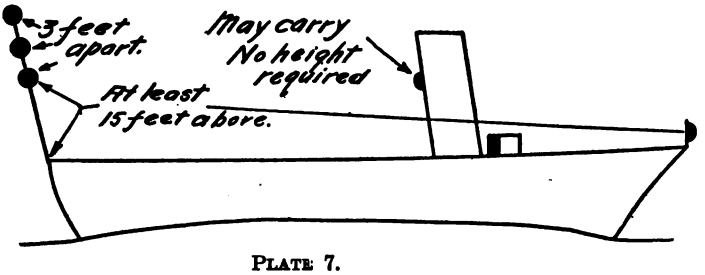
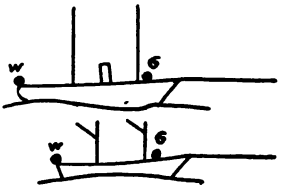




PLATE 7.

## Any Vessel Towed (International).

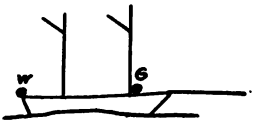
Articles 1-5,-10,-12.

Same as Sailing vessel.
See plate 1.




## Sailing vessel towed (Inland).

Articles 1,-5,-10,-12.




Same as Sailing vessel.
See plate 1.

PLATE 8.

Not
under Command (Steamer or Sailing vessel) (International)

Articles, 4,-a,-c,-d,-10,-12.

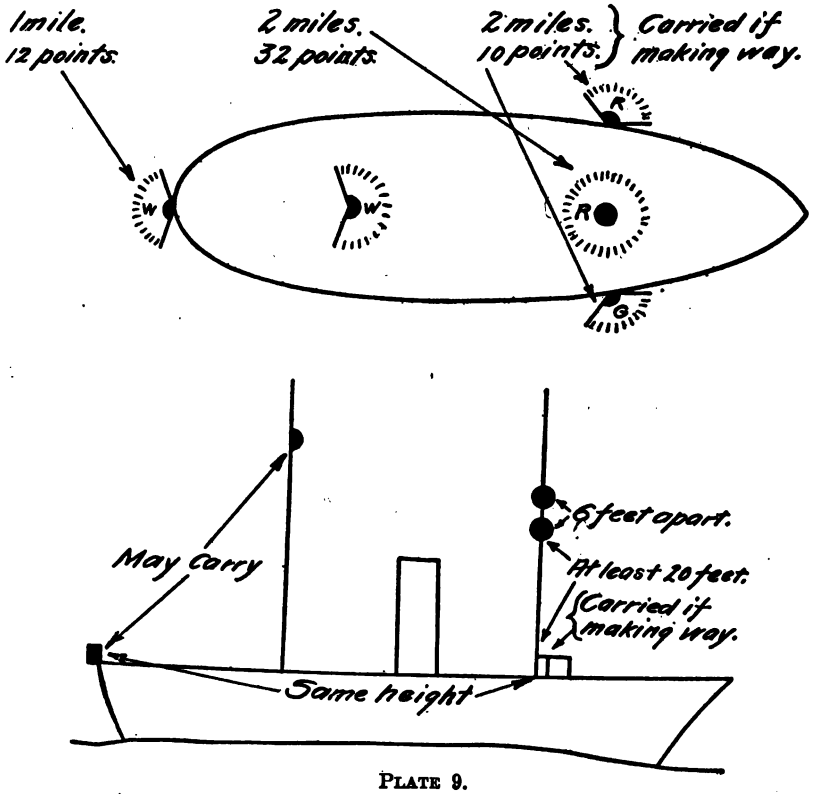
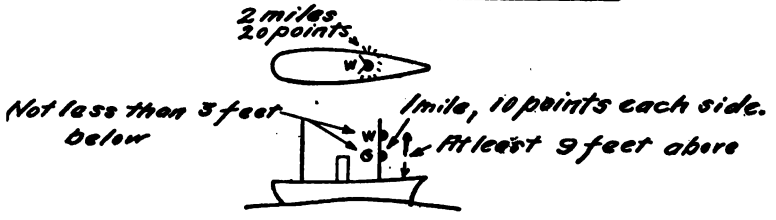



PLATE 9.

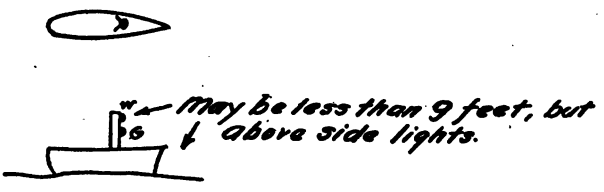
## Small Vessels

### Article 7. (Int.)

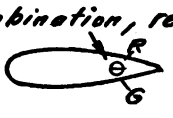
**Steam vessel less than 40 tons.**




**Small Steam Vessel, carried by sea going vessel.**



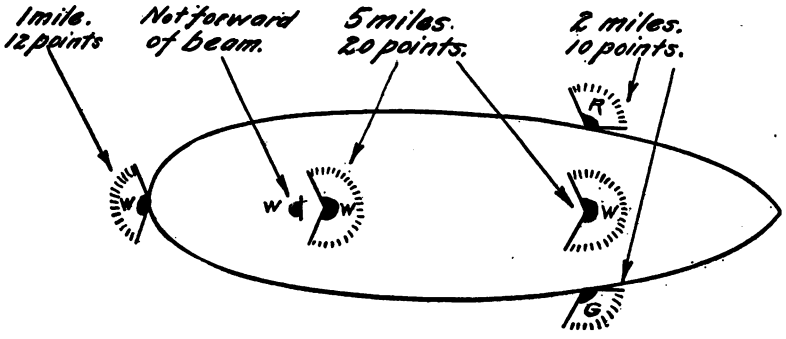

**Vessels under oars and sails less than 20 tons**




**Row Boats under sail or oars**

PLATE 10.

Sea-
Going Steamer Towing (International and Inland).
Articles 1,-2,-b,-c,-d,-e,-3,10,-12.



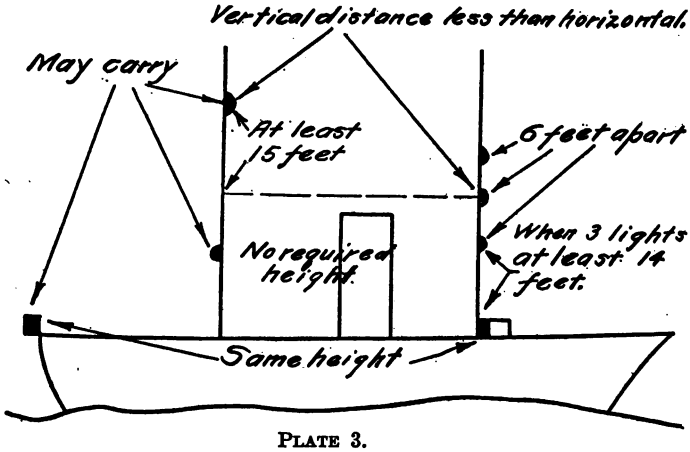
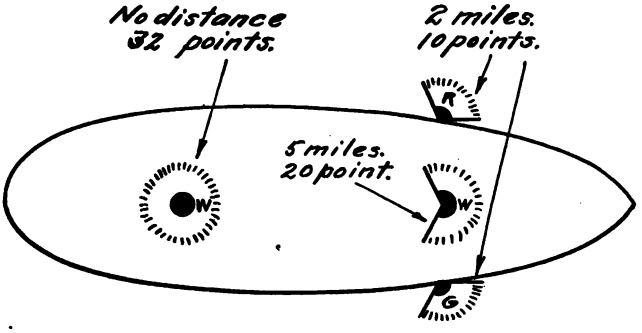




PLATE 3.

Non-
Sea Going Steamer, except ferry boats (Inland).

Articles 1,-2,-a,-b,-c,-d,-e,-f,-12.



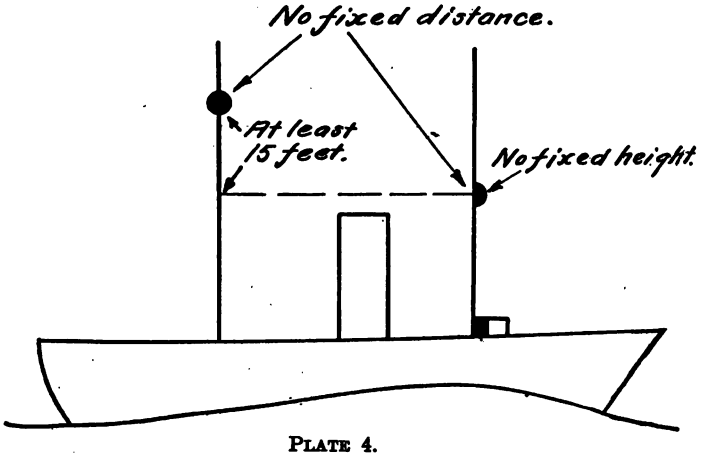
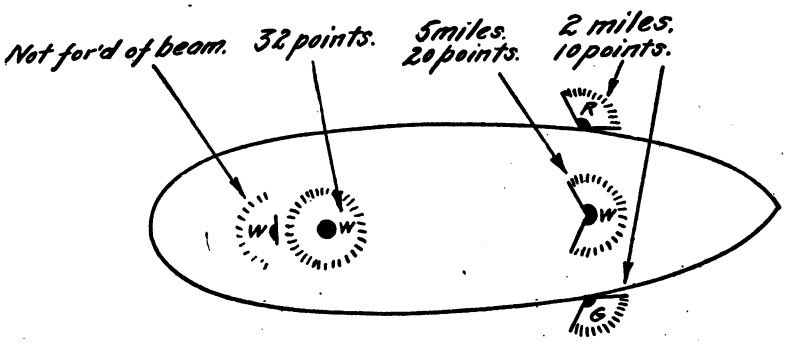




PLATE 4.

Non-
Sea Going Steamer Towing, except ferry boats. (Inland)
Articles 1,-2,-b,-c,-d,-e,-f, 3,-10,-12.



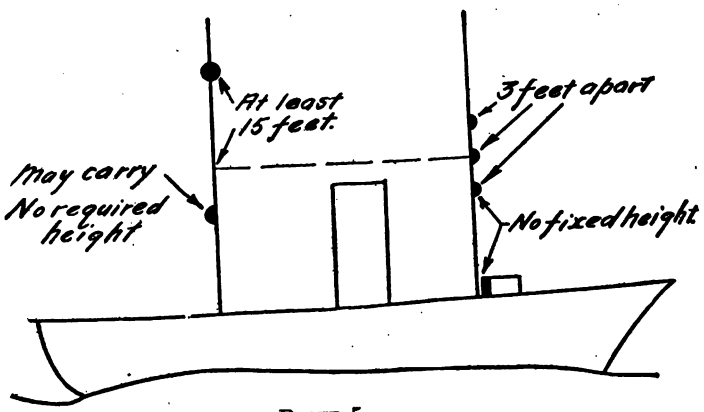
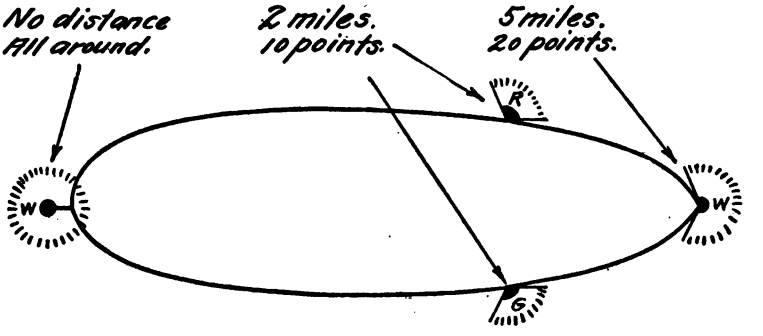




PLATE 5.

Non-
Sea Going Steamer, except ferry boats, (Inland).

Articles (Inland Rules) 1,-2,-a,-b,-c,-d,-e,-f,-12.

No foremast.



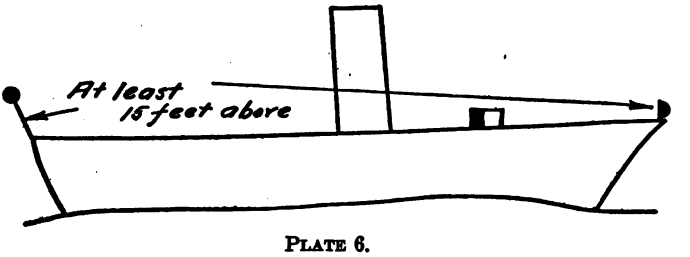
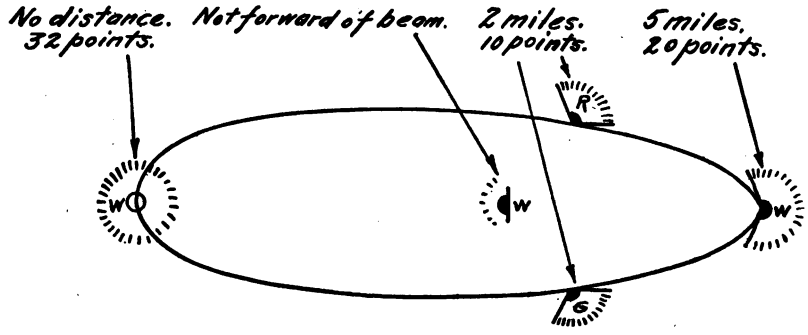




PLATE 6.

*Non Seagoing Steamer Towing, except ferry boats, (Inland).*

*Articles (Inland Rules), 1,-2,-b,-c,-d,-e,-f,-3,-10,-12.*

*No foremost*



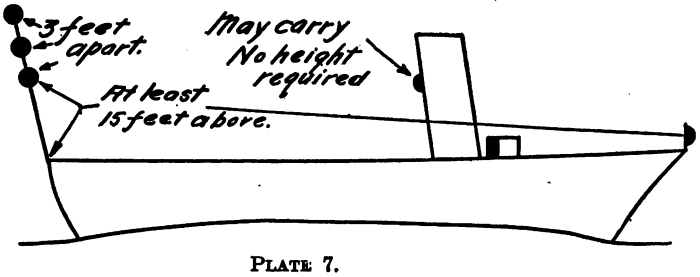
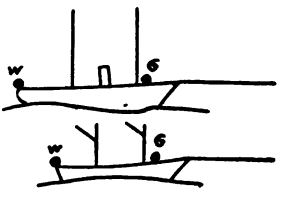




PLATE 7.

*Any Vessel Towed (International).*

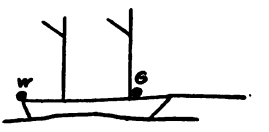
*Articles 1.-5.-10.-12.*




*Same as Sailing vessel.*
*See plate 1.*

*Sailing vessel towed (Inland).*

*Articles 1.-5.-10.-12.*




*Same as Sailing vessel.*
*See plate 1.*

PLATE 8.

Not
under Command (Steamer or Sailing vessel) (International)

Articles, 4,-a,-c,-d,-10,-12.

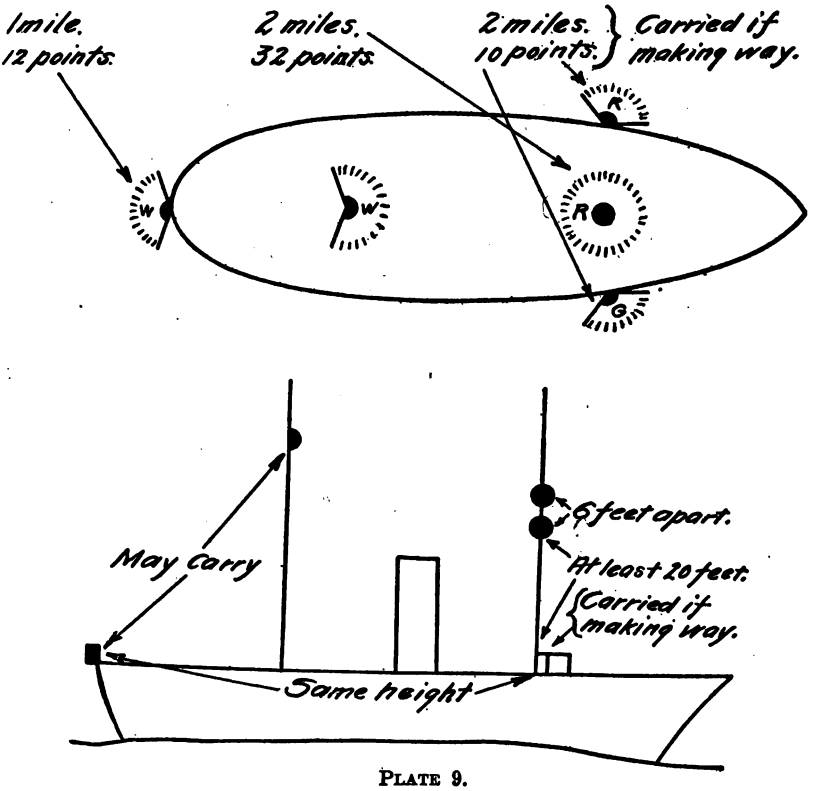
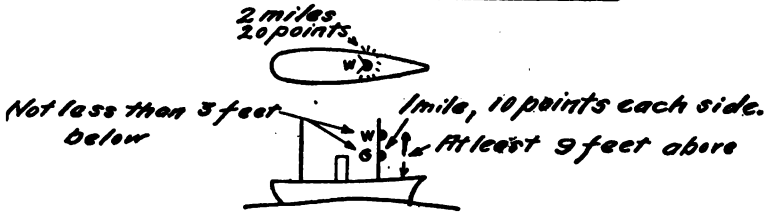



PLATE 9.

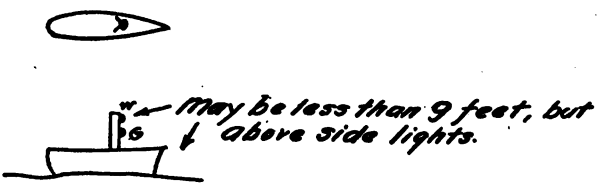
## Small Vessels

### Article 7. (Int.)

**Steam vessel less than 40 tons.**




**Small Steam Vessel, carried by sea going vessel.**




**Vessels under oars and sails less than 20 tons**

Combination, ready to show.

**Row Boats under sail or oars**

White, ready to show.

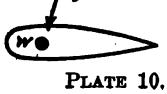



PLATE 10.

## Pilot Vessels, engaged on station,

Articles 1,-8,-12. Underway or at anchor.

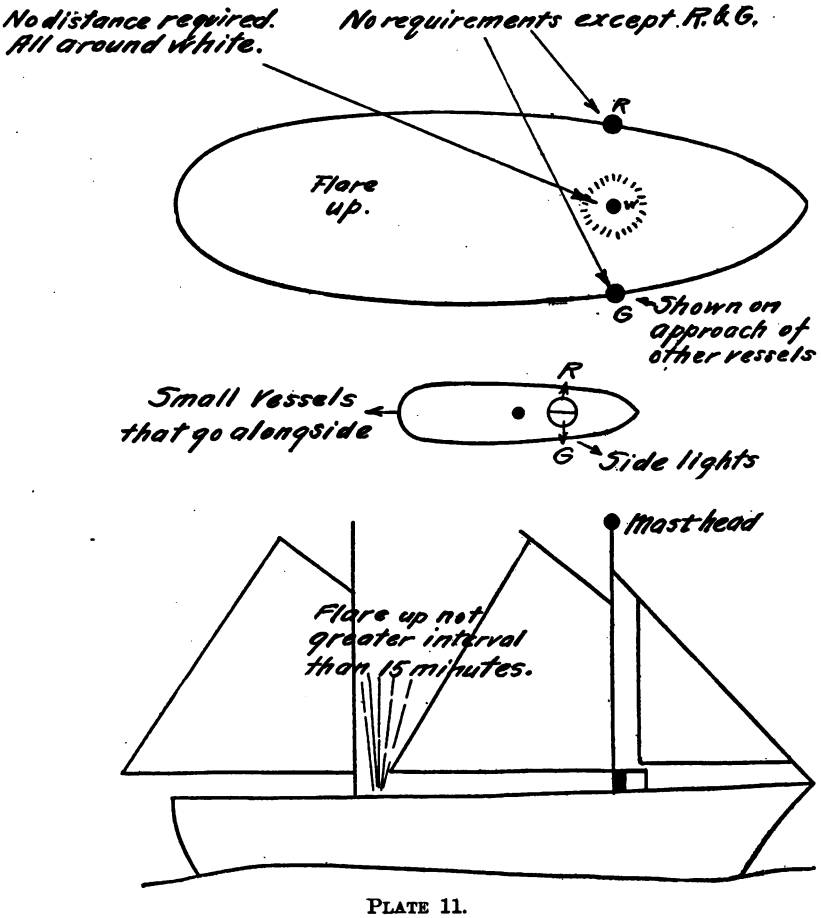
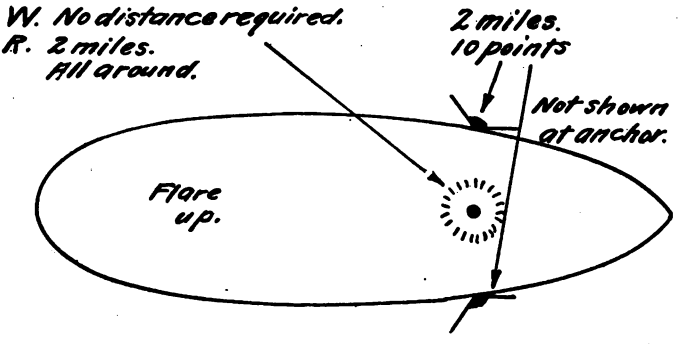



PLATE 11.

Steam Pilot Vessel, U.S. Waters, engaged on station.

Articles, 8,-12.




Pilot vessels exempt from showing lights of other vessels.

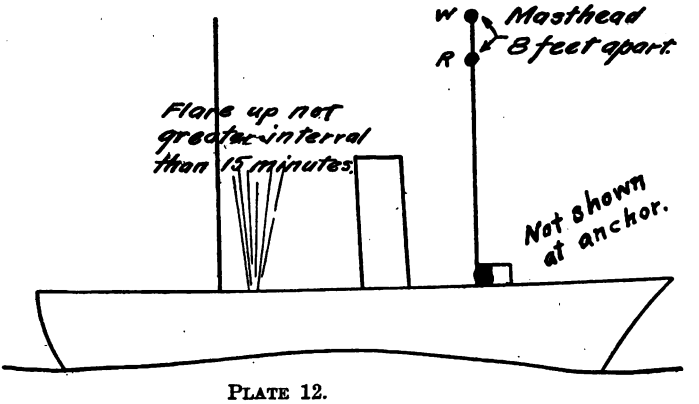



PLATE 12.

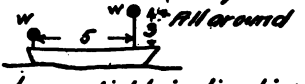
Fishing Vessel, (International).

Article 9.

Open boats (a).

Tackle less than 150 feet.

Tackle more than 150 feet

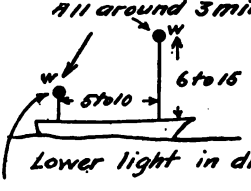



Lower light in direction of outlying tackle.

(f) May use flare up and working lights.

---

Except open boats (b) (Steamer, power, sail or Launch).




(f) May use flare up and working lights.

Lower light in direction of nets.

Mediterranean Sea, Japan and Korea, Sailing fishing vessels less than 20 tons not required to carry. On approach to show a white light visible 1 mile in same place.

---

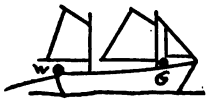
Except open boats (c) (Steamer, power, sail or Launch) line fishing.

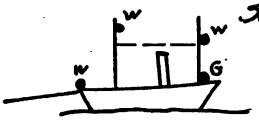
(Not at anchor or line caught on bottom).

Same as above.

PLATE 13.

Fishing Vessels (International)
Article 9 (c)
Except open boats (c) Steamer, power, sail or Launch)
Shooting lines or towing.

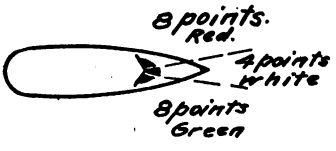


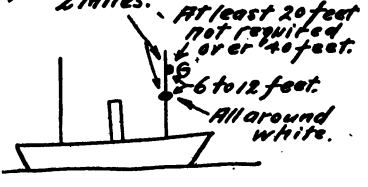




(f) May use flare up and working lights.

---

Steam Trawler - Oyster Dredger.
9 (d), (e).

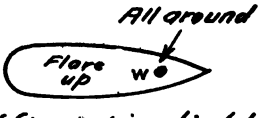



(f) May use flare up and working lights.

---

Sailing Trawler
9 (d)




(f) working lights

when approached

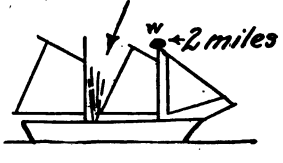



PLATE 14.

*Fishing Vessels (Inland).*

*Articles 9-a-b-c.*

*(a)*

*Less than 10 tons underway (No net, trawls, lines etc.)*

*Not required to carry colored side lights, but exhibit them on approach.*

*(b)*

*10 tons & over, underway (No nets, trawls, lines etc.)*

*Same as other boats.*

*(C)*

*All fishing vessels (trawling, dredging, nets, lines etc.)*

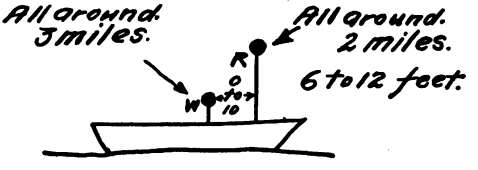
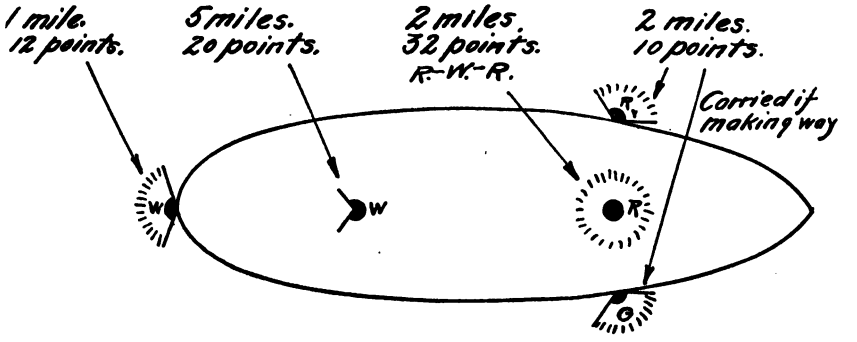



PLATE 15.

## Vessel Laying Cable, (International).

Articles, 1,-4,-b,-c,-d,-10,-12.



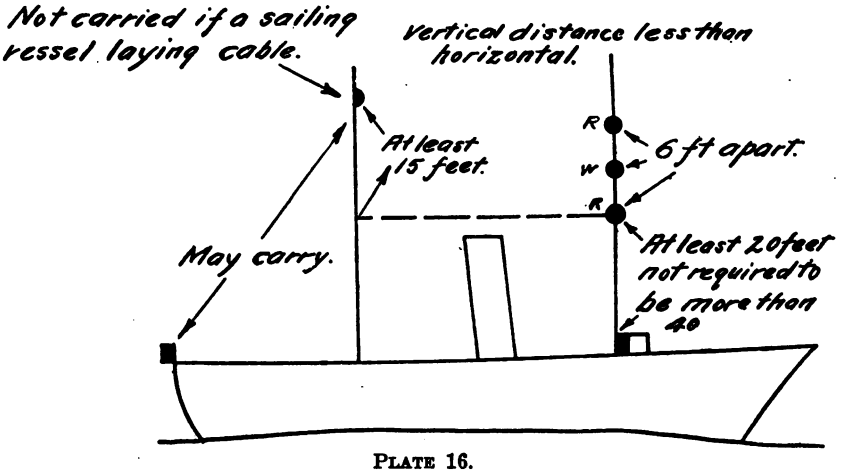


Not carried if a sailing vessel laying cable.
Vertical distance less than horizontal.
At least 15 feet.
R
W
R
6 ft apart.
May carry.
At least 20 feet not required to be more than 40

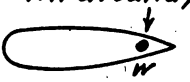
PLATE 16.

Anchor Lights. (International & Inland).

Article 11-8 - 9(g).

Steamer or sailing vessel under 150 feet in length.

All around, 1 mile.



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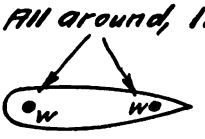
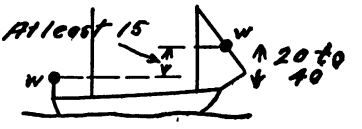
Steamer or sailing vessel over 150 feet in length.

All around, 1 mile.

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Pilot Vessel engaged on station, (Article 8).

Same as plate 11 except side lights.

Not engaged on station Same as above.

Fishing vessels, Article 9(g)

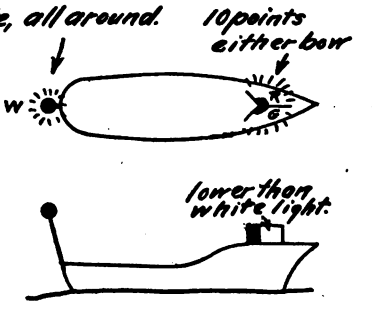
Same as above, except no specified height.

PLATE 17.

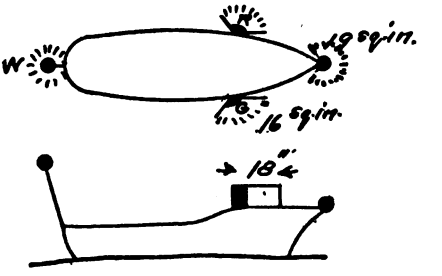
## Motor Boats (Sec. 8, pages 415-416 R).

Motor boats are vessels propelled by machinery, Not more than 65 feet in length, except tug boats and tow boats propelled by steam.

Class I less than 26 feet.




Class II 26 to 40 feet




Class III 40 to 65 feet.

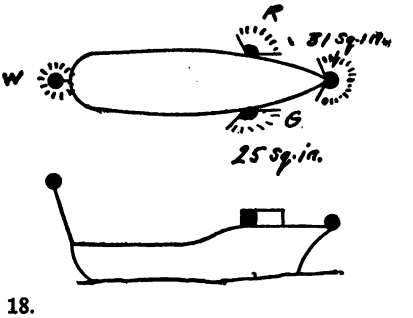



PLATE 18.

## CHAPTER VIII.

## GENERAL ORDER NO. 154.

NAVY DEPARTMENT,
WASHINGTON, D. C., July 15, 1915.

### ORDERS TO THE WHEEL AND TO THE ENGINE TELEGRAPHS.

1. This order supersedes General Order No. 98 of May 18, 1914, which should be marked "canceled" across its face.

2. The term "helm" shall not be used in any command or direction connected with the operation of the rudder; in lieu thereof the term "rudder" shall be used.

### Orders to the Wheel.

#### Manner of Giving Orders.

3. In conning: In giving commands to the quartermaster or steersman, the first command will be one of direction, *i. e., Right!* or *Left! Left, 10 degrees rudder!* The object being to insure the quick carrying out of the order by the steersman, who starts to turn his wheel instantly on receiving the command *Right!* or *Left!*

#### Standard Orders.

4. *Right (left) rudder!* or *Right! (Left!).* A command to give her right (left) rudder instantly, an indeterminate amount. In all such cases the officer conning the ship should accompany the order with a statement of his motive, or the object to be obtained, in order that the steersman may execute the order with intelligence and judgment. Thus "*Right rudder!* Head for the lighthouse." "*Left rudder!* Pass the buoy close on your starboard hand."

5. *Right (left), full rudder!*

6. *Right (left), standard rudder!*

7. *Right (left), standard half rudder!*

8. *Right (left), 5 (10, etc.) degrees rudder!* This order is used in making changes of course. The steersman should then be informed of the new course (by such term as *Course 275!*) in time to permit him to "meet her" on the new course.

9. *Right (left), handsomely!* This order is given when a very slight change of course is desired.

10. *Give her more rudder!* Increase the rudder angle already on to make her turn more rapidly.

11. *Ease the rudder!* Decrease the rudder angle already on when she is turning too rapidly, or is coming to the heading required. The order can be given *Ease to 15!* (*10, 5, etc.*).

12. *Rudder amidships!* In battleships, when making a turn, put rudder amidships when about 20 degrees from the new course.

13. *Meet her!* Use rudder as may be necessary to check, but not entirely, stop her swing. Given when the ship's head is nearing the desired course, and she is to be kept from swinging past the new course.

14. *Steady!* or *Steady so!* or *Steady as you go!*

15. *Shift the rudder!* Change from right to left rudder or vice versa. Given, for example, when the ship loses headway and gathers sternboard, to keep her turning in the same direction.

16. *Mind your rudder!* A warning to the quartermaster (or steersman), (a) to exact more careful steering, or (b) to put him on the alert for the next command to the wheel.

17. *Mind your right* (*left*) *rudder!* A warning that the ship shows a tendency frequently to get off her course, and that if right (left) rudder be not applied from time to time to counteract this tendency, the ship will not make good the course set.

18. *Nothing to the right* (*left*)*!* Given when the course to be made good is a shade off the compass card mark, and therefore that all small variations from the course in steering must be kept, for example, to the southward of the course set.

19. *Keep her so!* A command to the quartermaster (or steersman) when he reports her heading, and it is desired so to steady her.

20. *Very well!* Given to the quartermaster (or steersman) after a report by him, to let him know that the situation is understood. (The expression "*All right!*" should not be used. It might be confused as an order to the wheel.)

**Orders to the Engine Telegraphs.**

21. The command is in three parts:

(a) The first part is to the engine: as, *Starboard* (*port*) *engine!* or *All engines!* this puts the proper telegraph man (or both) on the alert. This is the preparatory command, and he should at once start his lever.

(b) The second part of the command is the command of execution, and it is the direction the engine telegraphs are to be moved: as, *Ahead!* or *Back!*

(c) The third part of the command gives the speed at which the engines are to be moved.

22. The following are all the commands to the engine telegraphs:

(a) *All engines, ahead one-third, two-thirds, standard, full!* or *All engines, back one-third, two-thirds, full!*

(b) *Starboard (port) engine, ahead one-third, two-thirds, standard, full! Port (starboard) engine, back one-third, two-thirds, full!*

**Orders Concerning Ship's Compass Course.**

23. All orders as to the course should be preceded by the word "compass"; "compass course, zero" (two-one; three-0-four; six-five, etc.); in every case naming the numbers separately.

**Repeating and Reporting.**

24. (a) Every command of the officer of the deck to the wheel or to the engine telegraphs must be repeated word for word by the quartermaster (or steersman) or engine telegraph men, as the case may be. This should be insisted upon. When the order to the engines is acknowledged by the engine room, and the revolution indicator shows that the engines are obeying, the telegraph man must report; for example, "Starboard engine backing one-third, sir!" "Port engine backing one-third, sir!"

(b) In all cases the officer of the deck must check the execution of his orders. This must be done to eliminate all chances of error.

JOSEPHUS DANIELS,
*Secretary of the Navy.*

## CHAPTER IX.

## HANDLING BATTLESHIPS IN FORMATION.

The following notes have been taken from various sources, principally from "Notes on Cruising in Formation," translated from the German by Commander R. R. Belknap, U. S. Navy; "Whispers from the Fleet," by Captain Christopher Cradock, R. N. C. B.; from Grant's School of the Ship; and from experience in the fleet. The points are practical and are known to all officers who have had experience in handling battleships in formation.

**General.**—Ship handling is one of the most important duties that officers are required to perform, and unless an officer is proficient in this he will not only be the cause of mortification to the other officers of his ship, but will be a source of danger to his own ship and to other ships in formation. The importance of maneuvering can be realized when one thinks that it is by this means that the guns are brought within range of the enemy. A fleet or squadron that is poorly drilled and incapable of rapid and accurate maneuvering is at a great disadvantage and will be unable to place the ships in such a position relatively to the enemy as to enable the maximum gun-fire to be developed. The opportunities for officers to practice handling and maneuvering battleships are very limited, and for this reason no chance for experience or information along this line should be neglected. Much can be learned by watching other officers, especially those who have gained reputations for skilful work in handling ships; but a great deal can also be learned by watching those who are not so skilful and by deciding in your own mind the causes of the failure or lack of skill.

Handling destroyers and smaller craft is the best practice that can be had, and an officer who has developed his judgment, nerve, and seaman's eye on a fast running destroyer is not likely to fail later when it comes to handling the slower moving battleship.

**Conning.**—An officer in conning from the bridge should stand in the place where he can best see what his own and other ships are doing.

*In column,* the best place usually is amidships near the wheel so that he will have this immediately under his eye and can see what the ships ahead are doing.

*In line or line of bearing,* the best place is near the pelorus on the side towards the guide and in such a position that he can still keep his eye on the wheel. The terms used in giving orders to the wheel and to the engine room telegraphs are prescribed by General Order No. 154. These terms should be thoroughly familiar to every officer and should be carefully adhered to.

## GETTING UNDERWAY AND STANDING OUT.

The details of this maneuver vary in accordance with the relative position of the flagship, the space for maneuvering, and the state of the tide. The usual faults that tend to spoil the maneuver are: (1) Ships do not get up anchor at the same time; (2) when it is necessary to turn the ships before standing out, the turns are not made together; (3) in standing out distance is lost by one or more ships.

The ships are anchored with the same amount of chain out and unless the order is given beforehand to "Heave short," no chain should be heaved in by any ship until the signal is executed to "Get underway." The anchor engine should be well warmed up, however, so that the instant the signal is executed, the order to "Heave around" can be given. The anchors of the various ships should break ground about the same time, ships having powerful, fast running anchor engines waiting for those having slower ones.

In order that all ships may weigh their anchors about the same time, the order to "Heave short" should be given first.

As soon as their anchors are up, ships should be ready to promptly take standard speed with the guide.

**First Case** (Fig. 1).—Ships anchored in column, lying to flood tide. This case presents little difficulty. The precaution necessary here *as in all cases of getting underway* is to have plenty of power in order that you may keep closed up and not lose distance. If necessary an extra boiler should be in use, the fires in good condition and the engines well warmed up. It is important that no ship should gather way until it is time for her to move, but when the proper time arrives ships should go ahead promptly and with such speed as to insure that standard distance will be maintained. One point that has usually to be considered in order to keep in position prior to starting ahead, is the swing or way given to the ship by the anchor engine in heaving in. This is counteracted by the engines when the anchor is aweigh. It is necessary for the officer of the deck to carefully observe the effect of weighing and also the effect of tide and wind on the ship, in order that any forces tending to take the ship out of position may be overcome at once and before they have acquired their full effect.

**Second Case.**—Ships anchored as before, but lying to the ebb tide or athwart the channel.

In this case it will be necessary for the ships to turn before standing out. All the ships should turn together following the motions of the flagship and *keeping her on the bearing of the anchorage.* You must know beforehand how to turn your ship on its heel, or if this is impossible, then in the shortest possible space. With out-turning twin screws, ships will usually turn on

their heel, by backing full on the inner screw and going ahead two-thirds on the outer screw with rudder amidships. The revolutions of the backing engine should remain constant and those of the one going ahead should be varied in order to keep way off the ship. The quartermaster in the chains will let you know, when required, what the ship is doing over the ground, and shore ranges should always be watched when practicable for the same purpose.

In shallow water (that is, with little water under the keel) it is better not to work either screw at full speed. Backing one-third with the inner screw and slightly faster ahead with the outer has been found successful.

With ships having four shafts and small propellers, it may be necessary to start the ship swinging in the proper direction by going ahead on all engines with hard over rudder, before backing the screws on the side toward which the turn is to be made. With four propellers, the rudder will assist when turning short around, and should be placed in position as if ship had headway on.

Experience is necessary in order to stop the swing at the proper point. Usually the engines are stopped when about 20 or 30 degrees short and then reversed when within about 10 degrees of the desired course.

**Third Case** (Fig. 2).—Being anchored in column inverted order to get underway and stand out in natural order, ships lying to flood tide. (This is the case where the flagship led the way into harbor and is going to lead in going out). Signal is made to cast to starboard or port. The rear ship obliques to the right (or to the left) as ordered, and, upon gaining half distance (unless channel is too narrow or otherwise directed), stands out or on course indicated. Other ships oblique in succession and follow the new leader. The flagship takes standard speed as soon as possible. In this case the difficulty for ships Nos. 2, 3, and 4, is to decide *when* to start their engines and *when* to go standard speed so that they will arrive in wake of the leader at standard distance.

In order to drop into column with ship starting from rest, *go ahead one-third speed* when your new next ahead is passing and is about two points abaft your beam; *go ahead standard speed* when she is abeam.

When ships are lying to the ebb tide, the maneuver is the same except that ships turn together first. The same remarks apply here as in Cases 1 and 2 about holding position, turning and going ahead promptly at the proper time; usually, however, ships turn about two points short so that they are in position to go ahead immediately.

**Important.**—It should be thoroughly understood on every ship, that whether in formation or acting singly, the officers of the ship are always responsible for her safe navigation. Therefore on entering and leaving harbor as well as at times when maneuvering on soundings, you should not blindly follow your leader under the supposition that because he safely passed foul ground ahead, you are bound to do so likewise. There are several things to be considered—the tide, the wind, and the natural deflection of the tail of a long column in turning. The resultant of these may be sufficient to set you down on the danger. Under these circumstances you should turn over the same *ground* as the leader and not in the same *water,* as this may have changed position considerably.

## IN COLUMN.

There is one general cautionary remark regarding handling ships in column with which all officers should be familiar and bear in mind at all times. It is, "Always consider your next astern." From this comes a more particular saying, "In column, ships should always be a little ahead rather than astern of position."

Steady steaming and uniformly good steering on the leading ship or guide are essential for good station keeping.

The officer of the deck of the leading ship should devote his energies to keeping the revolutions of the engines of his ship constant and to seeing that a steady and accurate course is steered. Any unsteadiness on the part of the guide is communicated down the line in an increased ratio, causing considerable increase in the coal consumption of the following ships and making it difficult or impossible for these ships to keep in position. In formation the revolutions of the engines of all ships should be checked frequently by revolution indicators on the bridge.

The officer of the deck of a following ship should, when coming on watch, pay careful attention to the station of the ship. By so doing for the first quarter of an hour, he may save himself trouble for the remainder of the watch. He should ascertain the average number of revolutions during the preceding watch, and providing the speed is the same, this number ought to keep the ship in position, when once she is steadied.

When steaming in column and a ship is out of position there are two ways of getting her back and steadied. Suppose that a ship is 50 yards behind position. When she started to lose distance the officer of the deck probably increased the revolutions by one or two turns and when she continued losing he did the same thing again until finally he had her steadied. At this point an addition of one or two turns should cause her to gain slowly, but he must remember to take off the additional turns *before* the ship arrives at the proper

distance, or she will over run due to her additional way. The mass of a battleship is very great and momentum is acquired and lost very slowly and an officer can only judge by past experience the exact time to increase or decrease the revolutions in order to have the ship steadied at the proper distance. Another method, and one probably more exact, is by using a fixed increase for a certain period. Suppose the officer of the deck has the ship steadied 50 yards astern of distance, and he knows that an increase of 6 revolutions of the engines will increase the speed 1 knot per hour. This will mean $\frac{200}{60}$ or $33\frac{1}{3}$ yards per minute. By increasing the speed by 6 turns for $1\frac{1}{2}$ minutes he will therefore gain the necessary 50 yards and he will know the exact time to reduce the revolutions.

When cruising in column an officer should endeavor to keep the ship in position with few changes of revolutions. Ten or 12 changes during a four-hour watch should be sufficient.

*To Change Course in Succession in Column.*—This is a very common movement and one with which all watch officers should be familiar. In making a column movement each ship should turn in the same water and on the same arc as the leader. The test is, that on each ship after having completed the turn of the number of degrees indicated, the officer of the deck shall see the masts of the ships ahead in line on the correct bearing and have his ship at the proper distance.

**Common Faults.**—1. *Steersman Following Stern of Ship Ahead.*—When the ship ahead puts her rudder over, her stern swings outward in the opposite direction across the course. The steersman, seeing that his ship is headed for the quarter of the ship ahead, eases off and follows her stern. This causes a sag of the column away from the direction in which the turn is to be made.

*Remedy.*—When ship ahead puts her rudder over caution the steersman to "Steer the compass course."

2. *Turning Outside.*—In this case the rudder is put over too late causing the stem of the ship to get outside of the wake of the ship ahead. In this position the screw current strikes her on the inner bow and causes her to go still further outside.

*Caution.*—Tactical instructions require that "a ship that *turns outside* of the wake of the next ahead shall not attempt to take her position in column at once, but shall steer a course parallel to that of the leader until the next astern has made her turn and shall then gradually sheer into position."

*Remedy.*—If the turn is started only a little outside, increase the speed to full, and give her more rudder—hard over if necessary. This should bring her back in the wake of the next ahead when the rudder can be eased and the speed reduced to standard. If the turn is started too late to attempt to

get back, ring up full speed, increase rudder to standard, but ease it in plenty of time to follow tactical instructions.

3. *Turning Inside.*—Rudder is put over too soon.

*Remedy.*—Decrease speed considerably, ease the rudder handsomely. If ship straightens out and threatens to cross the wake of the ship ahead, increase speed and rudder angle. If the ship actually crosses the wake, tactical instructions for a ship turning outside apply.

*Caution.*—Great care must be exercised in easing the rudder when turning inside as the ship will forge ahead when relieved of the drag of the rudder, causing the stem of the ship to get in close proximity to the quarter of the next ahead.

4. *Loss of Distance During a Turn.*—This is usually due to inexperience. In the turn, as the ship closes on the ship ahead, the officer of the deck, thinking the ship too near, reduces speed, with the result that when the turn is completed the ship is well behind position. This closing up during a turn is very alarming to a beginner, but he should realize that when the ship ahead puts her rudder over and starts to turn, her speed is greatly reduced due to the turn and the drag of the rudder across her stern. The ship astern still has standard speed and hence closes rapidly until the turning point is reached. At this point her rudder goes over, her speed is reduced, and the ship ahead, having straightened out on the new course, rapidly draws away. When both ships are straightened out they should be at standard distance, the engines not having been changed.

**How To Make a Turn.**—When the ship ahead puts her rudder over, caution the steersman "Steer the compass course."

When the kick of the ship ahead caused by putting rudder over is at the exact spot abaft the stem of your ship (a certain stanchion or some well-marked place ascertained by experience), give the order "Right (or left), standard half rudder." Keep the stem of your ship inside the rough water of the wake of the ship ahead, a distance equal to the beam of your ship—small changes of the rudder should accomplish this. When within 20 degrees of the new course give "Rudder amidships." When within about 10 degrees of the new course, "Meet her." When on the new course "Steady." Avoid stopping short by meeting her with too much rudder, but also avoid swinging past the new course.

The officer of the deck of the leading ship must exercise great care to come at once to the course after a turn, otherwise the maneuver will be made difficult for the ships astern and a delay will be experienced in forming a properly aligned column.

**Points to Remember About Turning.**—1. Tactical instructions prescribe that "the throttle shall not be touched during a turn except in obedience to an order from the bridge." The engine room should therefore be notified

when a turn is started. This is usually done by means of an electric indicator worked from the bridge that shows in the engine room during the turn, or by a rudder indicator in the engine room.

2. There is nothing in this or any order which precludes the officer of the deck from ordering a change of speed during a turn if he considers it necessary. It is better not to do so if it can be avoided. He should remember that *easing* the *rudder* during a *turn increases* the *speed,* and that *increasing* the *rudder angle decreases* the *speed.*

3. When the ship ahead turns outside of the wake of the leader, attention and experience are necessary to avoid duplicating her mistake. In this case the officer of the deck cannot go by her "kick" and wake and has to take his direction from the second ship ahead or from the line of ships that have turned. In turns up to 8 points a ship may be headed at first for the middle or even the bow of the ship ahead. If need be, the inboard engine can be stopped and the speed reduced. When the fault of the ship ahead is great, a ship turning properly will range close alongside of her. It is better in such cases to start the turn a little early and get it well in hand.

4. The turn in day time may be made on "time" and the turn at night and in a fog should be always so made, if practicable. Suppose standard speed is 12 knots, ships are at 500 yards distance, and that the ship is steadied in position. It is desired to start the turn at the point where the ship ahead started to turn. The time should be marked when in day time it was noted that the ship ahead put her rudder over, or at night when she sounded one or two short blasts on the whistle indicating this fact. At 12 knots it will take $1\frac{1}{4}$ minutes to cover 500 yards. The order to the steersman should be given about 10 seconds less than $1\frac{1}{4}$ minutes from the time marked to allow for time to put the rudder over and the delay in executing the order. If the ship is ahead or behind distance, a rough allowance should be made for this fact.

5. Standard half rudder has been prescribed for all turning movements in formation when making turns of more than 20 degrees and it is required that the rudder shall be put over in as near 6 seconds as practicable.

6. The officer of the deck must realize that the same amount of rudder does not always produce the same effect in the same time. It is necessary therefore that he should be alive to the actual conditions when executing an order to turn. If the ship is not steadied but is swinging at the time the order is given, and standard half rudder is maintained, the turn will be inside if the ship's head was swinging in that direction at the time the rudder was put over and will be outside if swinging the other way. In the first case the rudder will have to be eased a little immediately. In the latter case it will be necessary to give considerable additional rudder at first in order to

overcome the inertia of the swing and to start her swinging the other way promptly.

7. Under certain conditions the *wind* exercises a considerable influence on the size of the turning circle and on the time of turning. Ships in turning usually pivot at a point about *one-quarter* of their length from the stem. In turning *into* the wind therefore, a force caused by the pressure of the wind on the three-fourths of the wind area of the ship is acting with greater leverage to assist the turn, and is opposed by the wind pressure on one-quarter of the area, acting at a much smaller leverage. In making turns *away* from the wind the large force *opposes* the turn and the small one *assists*. Therefore a ship in turning *with way on* will fly up into the wind quickly, but will turn very slowly away from the wind. A ship going *astern* pivots very close to the stern due to the hold of the propellers on the water, and practically the whole surface of the ship in this case acts as a wind area to force the stern up into the wind.

## IN LINE.

In line, the *bearing* is taken from the foremast of the guide, and the *distance* from the *next vessel* towards the guide. If this latter ship is manifestly *out of position,* the distance may be taken temporarily from the second ship towards the guide until she regains position.

Although changes of speed do not affect other ships as in column, still it is important to steam as *quietly and steadily* as possible. The bearing of the *foremast* of the *guide* should be constantly observed. Immediate action must be taken as soon as any change in the bearing has been noticed.

If the distance is correct and the bearing is out a little, it is only necessary to increase speed if behind or decrease if ahead, but if out considerably it will be necessary to alter the course so that distance will be correct *when on the bearing.*

*If the bearing is correct,* in order to rectify *distance* a change of both *course* and *speed* are necessary. Only small changes of course should be made, not over 5 degrees as a rule. In this case, it must be remembered that a *change* of *course* in either direction necessitates an *increase* in the *speed* in order to *maintain* the bearing.

*If ahead of bearing* and inside or outside distance, by keeping standard speed and changing course either away from or toward the guide, the ship will drop back on the bearing at the same time gaining or losing distance.

*If behind bearing* and distance is out also, it will be necessary to speed up considerably in order to gain on the bearing and at the same time change course to gain or lose distance. In general, stick to the rule " that keeping correct *bearing* must be rated higher than keeping correct *distance,* and that above all never forge *ahead* of the line."

**Gaining Ground to Right or Left.**—All watch officers should know how many yards are gained per minute to starboard or port when changing course, 5, 10, and 15 degrees, etc., for the usual steaming and maneuvering speeds. By having such information a certain distance can be gained "working on time." Suppose the speed is 12 knots, then the distance steamed in one minute is 400 yards and the amount gained to the side for changes of course of 5, 10, and 15 degrees is 34.9, 69.5, and 103.5 yards. It is only necessary to remember that about 35 yards per minute are gained to the side for a 5-degree change of course at this speed, twice this for 10 degrees, and about three times for 15 degrees. The increase of speed necessary in maintaining bearing while closing and opening distance is small, as can be readily seen from Table 2, Bowditch (American Practical Navigator, 1916).

In steaming in *line* and *line of bearing* it usually requires a slightly fewer number of revolutions of the engines in order to hold position than when steaming in column. This is due to the fact that there are no ships immediately ahead to disturb the water and set it in motion.

## LINE OF BEARING.

Steaming in line of bearing is generally found difficult by the beginner, but with a little practice and a knowledge of a few fundamental rules it becomes much easier. The guide is always on the side towards the advanced flank. The bearing of the foremast of the guide should be constantly observed either by the pelorus or by marks on the bridge.

(a) *To correct distance and maintain the bearing, increase* speed if heading *towards* the guide and *decrease* if heading *away* from the guide. This may be better understood by reference to Fig. 3. A ship *B* is on a line of bearing *AB* from ship *A*, course north. If *B* is *outside* distance but on correct bearing, she must change course towards the guide *A* and instead of steaming along the line *Bb* she must steam along *BB'* which is longer than *Bb*. Speed must therefore be increased to keep on the bearing.

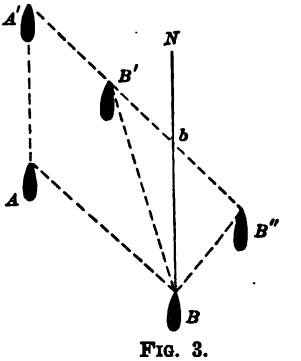


FIG. 3.

If she had been on the bearing but inside distance she would have had to steam away from the guide as along *BB''* which is shorter than *Bb*, and therefore speed would have had to be reduced.

(b) If *distance* is correct but ship is *ahead* of *bearing*, it will be necessary to head in *towards* the *guide*, at the same time reducing the speed a little in order to be at the *proper distance when on the bearing*. The bearing will

have to be carefully watched in order to resume standard speed in time, as the ship will drop back quickly due to a reduced number of revolutions and a change of course *towards* the guide.

If when ahead of bearing the distance is much too small, it will be necessary to *head away from* the *guide* and *considerably* reduce the revolutions in order to get in position quickly.

(c) If *astern* of *bearing* and with correct or *too little distance,* it will be necessary to head away from the guide to be at proper distance on the bearing. Only a small increase in the revolutions, if any, will be necessary, as *heading away* from the *guide causes* a *gain* on the *bearing.* If, however, you are astern of bearing and your distance is too great, you must change course towards the guide and at the same time *considerably* increase the revolutions.

(d) As in line, keeping correct *bearing* is more important than keeping correct *distance.* If off the bearing and it is desired to get back quickly, change course *towards* the *guide* if *ahead* and *away* from the *guide* if *behind* the *bearing.*

After a little experience it will be found that changes of course and speed necessary to keep position are usually small, and due to absence of screw currents from ships ahead, courses are more easily steered and ships are more readily kept in station.

## GENERAL INSTRUCTIONS.

To hold position correctly in any formation requires constant attention and alertness on the part of the officer of the deck. He should accustom himself not to rely too much on instruments, but educate his eye to judge distances so that he will be independent of them to some extent.

In maneuvering, when one movement is closely followed by the signal for the next, a ship out of position must regain it as quickly as possible by radical changes of course and speed. Until all ships are approximately in position, the signal for the next maneuver cannot be made. The importance of regaining position quickly is therefore obvious. It is quite as important to maneuver rapidly as to fire the battery rapidly.

A simultaneous movement is considered "well done" when *all* ships are in position when the movement is completed. To accomplish this rudder angles must be carefully standardized and turns must be started the instant the signal is hauled down. In case a ship is a little out of position when starting the turn, or gets out of station during the turn, the rudder angle and speed must be changed to bring her into position. All ships must put their rudders amidships when 20 degrees from the new course and must meet the swing so as to steady at once on the new course.

When a signal calling for a change of speed is executed, all ships should change promptly to the new speed and not wait for indications of a change from their next ahead.

When taking station in a moving column or a station *relative* to some other ship, it is the best and safest plan to use the mooring board in order to get the *time* to put over the rudder, or the *shortest course* to the assigned position. If done by judgment the rudder is usually put over too late in the first instance and a greater initial change of course than necessary made in the second.

When the ships of the fleet are scattered and a signal to form is made, *movements are governed by Rules of the Road.* This applies also to ships changing position independently at any time. Nothing justifies getting a ship to position smartly at the risk of her safety or that of another ship.

When standing up to communicate either verbally or by boat with a ship that is stopped reduce speed in plenty of time, and keep the stem of your ship pointed away from the other ship. When time to back, be sure your ship is steadied or that the bow is swinging away from the other ship.

## COMING TO ANCHOR IN FORMATION.

It is important that two-thirds and one-third speed should be standardized as carefully as "Standard speed," and that the leader of the column, when indicating either of these speeds, should maintain the proper number of revolutions as carefully as at other times. A little carelessness on the part of the leader when approaching an anchorage can make serious trouble for the ships astern.

When approaching an anchorage, or at any time in formation when the speed is much reduced and the ship is out of position, a radical change should be made in the revolutions for a short period of time. This is necessary in order to regain position quickly. When a ship has little way it requires a considerable change in the *speed* of the *engines* to overcome her inertia and get her back in position within a reasonable time. Turning the engines at low speeds when the ship is at rest or nearly so is ineffective.

An anchorage is usually approached in column and the ships anchor simultaneously when the signal is executed by the flagship. Any ship not in position when the anchor is let go will have to get up anchor and shift her berth. It is very important then that ships should keep position carefully and that any ship out of position should get back as quickly as possible.

Sometimes a flagship slows to two-thirds speed, then later to one-third and stops the engines when at a distance from the anchorage such that the speed will be reduced to about three or four knots when arriving at the designated place. Another method is to hold on at full speed until such a point is

reached that when the engines are stopped the way will be sufficient to carry the ships to the anchorage. In this case it is necessary to know what distance is required for the ship to lose the way from standard speed to that for anchoring and allowance made for wind and tide. This method will get the ships to the anchorage in the quickest time, but unless ships are all about the same displacement it is impossible for them to retain position without using their engines.

When anchoring in formation, as well as when approaching an anchorage in a crowded harbor, or in the vicinity of other ships, ample steam pressure should be maintained so that the ship may be controlled in case of emergency.

If during the approach it becomes necessary to back the engines for any cause, the speed cones or light should if possible indicate this fact *before* the engines are backed. This applies at all times to ships in column formation.

If in backing it is desired to retain the same heading, care will have to be used to see that the ship is steadied with rudder amidships *before* the engines are moved. If a ship starts to swing, the only way to check her is to go ahead full speed all engines with rudder hard over and start her to swinging in the other direction and then reverse again. When anchoring in succession or approaching another ship, and it is desired that the ship's stern shall swing in a certain direction, the swing must be started *before* the engines are backed. The ship may be relied upon to continue the swing after the engines start backing.

In anchoring, a ship should never be snubbed by the chain, but should be brought up by the engines, veering chain as necessary, and later heaving in if beyond the required scope. Battleships are very heavy and their momentum is very great. The chain, if used to bring them up, may not part at the time, but it will suffer a severe strain and may part later when subjected to a sudden stress as produced by a heavy squall. It should be remembered that bower chains when stretched out taut will stand a tremendous strain, but when they are nipped in the bend of a hawse-pipe will snap very freely.

If the engines are used for any purpose when the anchor is *down,* speed cones or lights should not be used to indicate this fact.

CHAPTER X.

# HINTS TO YOUNG OFFICERS TAKING THE DECK.

## GENERAL PREPARATIONS.

1. The chapters of the Navy Regulations and Naval Instructions with which all junior line officers are required to especially familiarize themselves are itemized in chapter 17, United States Naval Instructions. Of these chapters the following are of particular importance in preparation for deck duty, and should be carefully studied and frequently reviewed: Navy Regulations, chapters 12, 14 (certain articles), 24, and 41; Naval Instructions, chapters 16, 23, and 24.

Before standing any watch at sea or in port an officer should know how to write up the log of his watch. To prepare for this, he should carefully read the "Directions for Keeping the Ship's Log," contained in the front part of the Deck Log, and also "Notes on Writing the Deck Log" (Chapter XI).

Before standing watch underway in formation, in addition to Chapter 41, Navy Regulations (Rules of the Road), he should review General Order No. 154, the Battle Signal Book, and "Handling Battleships in Formation" (Chapter IX).

It is well for young officers to get in the habit of taking their Navy Regulations on deck with them for port watches, and the Battle Signal Book for watches underway in formation.

## SPECIAL PREPARATIONS.

2. An officer should know his own ship—her armament, construction, subdivision and water-tight arrangements; location of various fittings, magazines and store rooms, offices and living quarters.

In order that he may be prepared for emergencies while underway or at anchor, he should know the following:

(a) The locations of the instruments for springing the general alarm and warning howlers on bridge and quarterdeck, and how to operate them.

(b) The location of the instrument for closing water-tight doors mechanically, and how to operate it.

(c) The stowage place of the collision mat and its gear, and the method of getting the mat over.

(d) How to turn search-lights on and off.

(e) How to veer chain in an emergency.

(f) How to let go an anchor.

(g) The locations from which the ship may be steered, and the method of shifting from power to hand steering gear.

(h) Location of life-buoys and how to let them go.

(i) The interior communication system, and especially how to communicate with the captain in an emergency.

3. An officer should first study his ship and next the organization of the personnel for battle, administration, safety, and cleaning. He should familiarize himself with the *general* requirements of the watch, quarter, and station bill, and should make a thorough study of that part for which he is responsible as a division officer. In routine watch standing work, familiarity with the cleaning bill enables one to carry on work with intelligence and dispatch and at the same time to avoid friction.

An officer should know:

(a) The calls used on his ship for all emergencies, general drills, routine purposes, and boats, and where these calls are to be sounded.

(b) The sea details habitually stationed and the divisions from which they are detailed.

(c) The additional details made for fog or other circumstance.

(d) The details for " man overboard " evolution, including the lookouts.

(e) The detail of petty officers for duty at anchor engines and in connection with the ground tackle.

(f) Any special details, such as torpedo-defense lookouts, war-time cruising, etc.

4. In order to be efficient a watch officer should be familiar with the tactical data and maneuvering qualities of his ship.

He should know:

(a) The masthead heights (day and night) of his own ship and the ships adjacent in formation.

(b) The number of degrees of rudder for full, standard, and standard half rudder.

(c) The advance and the turning circles of his ship with full rudder, standard rudder, standard half rudder, and with one engine stopped or backing.

(d) How to turn ship on her heel from rest.

(e) How the ship loses way at various speeds when engines are stopped and when engines are backing.

5. Before taking the deck for the first time on the ship to which he is ordered, an officer should carefully read the captain's order book and the routine or executive officer's order book, making notes of all important orders. He should also examine the port routine and the sea routine. If the ship is attached to a fleet, he should ask for a copy of the " Fleet Regulations " and should study them carefully.

## PREPARING THE MIND FOR EMERGENCIES.

6. Prior to and during his watch it is a good plan for an officer to mentally picture casualties that might occur requiring quick thinking and efficient action. For instance, at the beginning of a watch, one should decide in his mind exactly what he would do in case of "Man overboard," both from his own ship and from the ship ahead; in a fog, what he would do in case of collision or threatened collision; if a breakdown occurs in formation, which way he would turn; or if attacked by a submarine, how he would maneuver the ship and what he would do, depending upon her bearing.

An officer must be ready for all such occurrences, and in order to be ready it is necessary to anticipate ordinary emergencies by preparing in the mind exactly what orders should be given. This is the only way to avoid the loss of time that would follow, should it be necessary to think out the method of meeting an emergency.

## MANNER OF RELIEVING THE DECK.

7. It should be a matter of pride with every officer to relieve the deck on time. In order to do this, at least five minutes should be allowed for obtaining the necessary information from the officer about to be relieved. All necessary preparations for the period of the watch should be made in advance. If necessary to examine the chart or to read the night orders one should do so before presenting himself to the officer having the watch.

The correct formalities to be observed in taking over the deck are as follows: The relief officer proceeds to the starboard side of the quarterdeck, or wherever the officer of the deck may be, salutes and reports, "Sir, I am ready to relieve you." The officer of the deck then turns over the necessary information as given in paragraph 8 or 9. When the relieving officer has grasped the situation and thoroughly understands the condition of affairs he again salutes and states, "I relieve you, sir." The responsibility of the deck is then his.

## INFORMATION TO BE OBTAINED BEFORE RELIEVING AT ANCHOR.

8. Before relieving the officer of the deck at anchor, the following information should be obtained:

(a) *Condition of Ship.*

If anchored—anchor down; scope of chain out; depth of water; kind of bottom; bearings of anchorage.

If moored—scope of each chain; whether or not mooring swivel is on; whether mooring is taut or slack; condition of hawse.

If moored to dock—lines used and their condition; brows in place and whether camels or spur shores are used.

Tide to which ship is riding; time and direction of last swing, both when the ship is at anchor and when moored.

Anything affecting the appearance of the ship, such as scrubbed clothes or canvas up, bedding or bunting being aired.

(b) *Boilers and Engines.*

Boilers in use for auxiliary purposes.

Any repairs to engines, boilers, or auxiliary machinery that will prevent getting underway in the usual length of time.

(c) *Boats.*

Condition of all boats, location of those down, boat schedule, running boat, landing in use; any special orders concerning or given to boats.

(d) *Personnel.*

(1) Captain, location of. If ashore or away on duty, name of commanding officer.

(2) Officers, ashore, sick, or away on duty.

(3) Working, liberty, or recreation parties away from the ship, and orders concerning.

(4) Prisoners and their status.

(5) Visitors on board.

(6) Uniform for officers and crew.

(e) Work in progress on board.

(f) Weather—condition of, barometer reading and whether rising or falling.

(g) Ships present in sight; guard ship; senior ship.

(h) Orders—all unexecuted orders, standing orders, any special orders or instructions that are to be passed along.

**Additional for Night Watches.**

(i) Life-boat—which boat is designated as such, and its condition.

(j) Anchor watch—petty officer in charge and where to find watch.

(k) Where the following men swing or may be found:

(1) Boatswain's mate of division having charge of anchor gear.

(2) Petty officer stationed at anchor engine.

(3) Bugler.

(l) Morning order book—location of, any orders for which it is necessary to prepare.

(m) Any special watches, such as torpedo-defense group on duty.

**INFORMATION TO BE OBTAINED BEFORE RELIEVING UNDERWAY.**

9. Before relieving underway, the following information should be obtained:

(a) Course (p. s. c.) and by steering compass, or by gyro; speed in knots and revolutions of engines; amount of rudder ship is carrying.

(b) Boilers in use. Any boilers, engines, or auxiliary machinery under repairs or not in good condition.

(c) If in company with other ships, the standard speed, formation, distance, interval, number of revolutions to keep position, and the order of the ships in column, and especially whether own ship is odd or even; whether position buoy is ready to go over, and in addition that search-lights and signal gun are ready at night or in a fog.

(d) Location of ship on chart and with reference to land, shoals or rocks which may be near. Any landmarks or aids to navigation in sight or expected to be sighted. If on soundings, whether leadsmen are in the chains or details for sounding machine standing by.

(e) Condition of ship.

(1) Ground tackle—whether secured for sea or ready for letting go.

(2) Water-tight doors and appliances for operating, what doors are closed (especially night and fog).

(3) Gun and air ports, hatches; closed or not.

(4) Scrubbed clothes and canvas up.

(5) Life-boats and buoys—ready for instant use.

(6) Signal apparatus, including whistle and siren.

(f) Personnel.

(1) Location of captain.

(2) Lookouts and sea details stationed and instructed.

(3) Watch up and ready for duty.

(4) Life-boat's crew mustered and stationed.

(g) Weather, wind, and sea; reading of barometer, whether rising or falling. Any indication of approaching bad weather.

(h) Any vessels in sight and whether the bearings taken are drawing ahead, aft, or are stationary.

(i) Any work in progress on ship.

(j) All standing orders, unexecuted orders, or special orders to be passed along.

(k) Torpedo-defense crews on watch and their instructions.

**Additional for Night Watches.**

(l) Read and initial captain's night order book. Find out location of executive officer's morning order book and read any orders for which it is necessary to prepare.

(m) Condition of running lights. Location of " stand by " lights.

(n) If running without lights, what circuits are on.

## AFTER RELIEVING AT ANCHOR.

10. After relieving at anchor, an officer should habitually stand his watch on the starboard side of the quarterdeck and carry out the " port routine." He should receive reports from, and give orders to, all boats leaving or returning to the ship (either in person or through the junior officer of the watch). He should have the junior officer of the watch inspect the upper decks by day at intervals when he can be spared. In making these inspections the junior officer should be cautioned particularly to see that: Men are in uniform; no infractions of smoking regulations; boat keepers alert and not lounging in their boats; ventilators properly trimmed; pennants and colors chock up and clear; awning stops properly passed and ends expended; no clothes hanging about in unauthorized places; decks cleanly swept down and waterways cleaned out; torpedo-defense crews on watch, alert, and keeping a bright lookout; chain properly secured, how tending, and if there is a strain on it. At night he should see that no unauthorized lights or fires are burning; that anchor lights are burning; that the signal watch is alert, and that men are not sleeping in unauthorized places.

At night the petty officer, or corporal of the guard, or other person detailed for this purpose, should be required to make the rounds of the ship every half hour after 10 p. m. and until " All hands " are called in the morning. During these rounds the petty officer should inspect the lights and prisoners; see if irregularities of any kind are taking place, and report the result of each inspection to the officer of the deck. The junior officer of the watch should also be required to make these rounds every two hours or oftener if necessary, providing his services on deck can be spared.

The officer of the deck should see that the columns of the log are properly filled in and should check up entries therein as necessary. He should require the quartermaster to keep a notebook and to enter all occurrences therein, with the time of each.

The officer having the morning watch should initial the morning order book and return it to the executive's office by 8 a. m.

## AFTER RELIEVING UNDERWAY.

11. After relieving underway an officer should:

Verify information turned over by previous officer of the deck.

Carry out "sea routine."

Frequently verify course and check up revolutions.

Be prepared to plot position of ship if called upon or if necessary for his own information.

Keep all sea details alert and instructed as to their duties.

Muster the life-boat's crew of the watch at the beginning of each watch, and receive reports concerning crew and life-boats.

Make sure that torpedo-defense crews on watch are alert and thoroughly prepared and instructed.

In all orders to the wheel or engine room telegraphs, use exact terms prescribed by General Order No. 154.

Check up the entries in the columns of the log, particularly those with regard to courses steered, distances run, wind and weather.

If in formation he should:

Require junior officer of watch to take and report distance by stadimeter constantly.

Keep proper distance. If unable to do so he should report to captain.

### Additional for night watches.

Muster the watch at the beginning of each watch.

Inspect the running lights, see them burning brightly unless ship is darkened, and have their condition reported every half hour with the bell.

Have "stand by" oil lights ready and lighted.

Have inspections of lower decks made every half hour, as outlined in paragraph 10 for port.

Twice each watch have gunner's mate report the signal gun and condition of the battery and the carpenter's mate report the soundings of the double-bottoms.

If it is the morning watch, return the captain's night order book and the executive's morning order book to their respective offices by 8 a. m.

## MANNER OF PERFORMING DUTY.

12. The manner in which an officer of the deck should carry on his duties, together with instructions concerning his bearing, etc., are fully described in Navy Regulations, articles R 1519, R 2609, R 2610, and R 2632. These articles should be read carefully and carried out scrupulously. By these Regulations orders are required to be given in a decided and authoritative tone, no louder than necessary, using the phraseology customary to the service,

and without any unnecessary repetition. An officer should make it a point to familiarize himself with the sea terms in ordinary use on board ship, to use these terms where appropriate, and to require those under him to do the same.

In giving orders that are to be repeated or passed the Regulations require the officer of the deck to use the exact words proper to pass them, and not permit any changes or additions by his subordinates.

An officer should require the boatswain's mate, the bugler, and the messenger of the watch to remain habitually at their assigned stations, alert, and ready for duty, unless away in execution of his orders. It should never be necessary to preface orders by such expressions as "boatswain's mate" or "bugler."

He should exact a silent and prompt performance of duty and should never permit any unnecessary noise or confusion in the execution of his orders. He should be just, impartial, and fair in his dealings with the crew, and, above all, *should never lose his temper.*

## REPORTS TO CAPTAIN.

13. Article 2602, Navy Regulations, specifically prescribes a number of reports that are to be made to the captain, but the reports itemized there do not comprise all the reports that should be made. At the end of paragraph 6, will be noticed a very comprehensive clause requiring, "in general, all occurrences worthy of notice" to be reported.

It is better to make too many rather than too few reports. A safe rule to follow is, when in doubt, make the report. When reporting a change of course, sighting aids to navigation or anything important by the messenger or orderly, it is better to send a written memorandum to the captain, otherwise the report might be given to the captain incorrectly. At sea if the captain is on the bridge, or in port on the quarterdeck, all reports should be made to him, in person.

## VARIOUS INCIDENTS.

14. Following are enumerated various incidents which frequently arise with the corresponding action which should be taken by the officer of the deck in each case.

| INCIDENT. | WHAT DO. |
|---|---|
| *Accidents to equipage, material, etc.* | Require full reports from officers or petty officers of all damage to government equipage or material, including how damaged, when, responsibility for, extent of damage, etc.<br>Log fully. Report to executive and also to captain if serious. Send slips to head of department concerned and supply officer. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Affirmative, use of, in getting underway in formation.* | *After signal* to *get underway* is *executed,* halfmast affirmative when (1) anchor is at short stay; run all the way up when (2) anchor is aweigh; haul down when (3) ready to take and hold position in formation. |
| | At night: turn on affirmative at (1); running and speed lights at (2); turn off affirmative at (3). |
| *Aids to navigation sighted.* | Report to captain and navigator. |
| | Get bearings of, note time sighted, and log. |
| *Ammunition comes aboard.* | Report to captain, executive, and gunnery officer. |
| | Notify ordnance gunner. |
| | Order chief police petty officer and corporal of guard to put out smoking lamp and extinguish unauthorized lights and fires. |
| | Hoist powder flag (boy). |
| | Log fully amount taken; kind of shell; number of charges of each index; from whence received; by what authority, etc. |
| *Ammunition is sent from the ship.* | Report to captain and executive. |
| | Haul down powder flag. |
| | Cover ammunition with tarpaulin when on deck for any length of time and in transit (Bu. Ord. Ins.). |
| | See powder flags in bows of all boats carrying ammunition. |
| | See memorandum receipts on tug, before she shoves off; get them from gunnery office. |
| | Log fully (see above). |
| *Anchor or running lights go out.* | Send for electrician of signal circuit. Have quartermaster rig " stand by " oil lights. |
| *Anchor, at, in tideway.* | Have an efficient lookout stand by life-buoys. |
| | Put over drift lead; get range on shore. |
| | Take precaution to ascertain if ship drags. |
| *Ash chute gets choked up.* | Notify first lieutenant and carpenter. |
| *Ashes, request to expel from engine room.* | At anchor. Be cognizant of port instructions—if permitted, see boats clear of ship's side near discharge from expelling device. |
| *Ash lighter or water boat comes alongside.* | Notify executive, engineer officer, and supply officer. |
| | Inform engineer officer of the watch by telephone. Inform captain of fresh water hold. If a local lighter, log owner, time of coming alongside and shoving off, and amount of water taken. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Bags or hammocks to be served out.* | Notify first lieutenant, division officers, boatswain, and sailmaker's mate. Divisional officers usually send men to break out their division bags and hammocks. They are served out at quarters and results reported in memorandum form to first lieutenant. Report completion to executive officer. |
| *Barges, coal, coming alongside.* | Report to captain and executive. Notify boatswain. Make preparations to receive. See properly placed and secured. Log time of arrival, number of each barge, how much it contains, where placed, and from whence received. |
| *Bells, striking of* | Follow motions of flagship or senior officer present in this respect. |
| *Binnacle lists* | If the medical officer wishes to place a man on the sick or binnacle list, he sends name to officer of the deck on a slip requesting permission. Send this to captain for approval, and return to the medical officer. |
| *Board of Survey comes on board.* | Report to captain. Have messenger show them to ward room. Notify head of department concerned and supply officer. |
| *Boats crews away during meals.* | Order commissary steward, chief police petty officer, and ship's cook to save hot meals for them. |
| *Boat, power, needs refueling.* | Put sufficient number of 5-gallon tins on board, have boat shove off from ship, fill tanks and then return empty containers to ship. |
| *Boats, power, breakdown.* | Inform engineer officer of watch. Report to executive after an inspection how long boat will be laid up. |
| *Boats, heavy, to be hoisted out or in.* | Notify boatswain or chief boatswain's mate of boat deck. Allow only certain skilled men to operate cranes. |
| *Boat—requested by officer.* | Request permission of executive to use boat and report her return to executive. |
| *Boats at booms* | Have boat keepers in uniform of day. See boats in order, with no clothing hanging in steam launches. Do not allow steamers' crews to sleep on decks of boats at boom. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Boats running*..... | *Carry out schedule,* whether any one is going ashore or not. Shove boats off on time, both from ship and shore. Do not permit a running boat to be diverted by stopping at other ships or landings. See that coxswain knows landing in use and the compass course to the landing from the ship. |
| *Book, General Signal, whereabouts of.* | One copy with captain; one with signal officer; make sure that latter informs you of its location, if he leaves the ship. |
| *Bugle calls*..... | Follow flagship or senior officer present in sounding routine calls. |
| *Buglers, messengers, etc.* | See in proper uniform at all times. |
| | See that they remain at hand, except when engaged on duty that takes them away from station. |
| *Bunker or magazine fire alarm sounds.* | Have engineer officer or gunnery officer investigate at once. |
| | Notify engine room and ordnance gunner. |
| | Report results to captain and executive. |
| *Calls for men, not answered.* | Direct petty officers of division concerned to send men at once. |
| *Calling committee comes aboard.* | Send to president of mess concerned and show guests to the proper mess room. |
| *Captain—commanding officer.* | Note distinction between captain and commanding officer. The captain is ordered as such by proper authority—any line officer may be temporarily in command. |
| *Captain or executive leaves or returns to ship.* | Notify next junior line officer. When captain leaves see boat cloth in boat. At night turn on his absentee light when he leaves and turn off when he returns, unless flag officer (if ship is flagship) is also absent. |
| *Captain wishes to be called.* | Called by his orderly. Report weather conditions to him when you call him. |
| *Chain cable parts*..... | Let go another anchor immediately. Buoy position of lost anchor at once, if not already done. |
| | Notify captain, executive, first lieutenant and boatswain. |
| *Change of course in accordance with previous orders.* | Get captain's permission if he is on bridge. If not, change as directed, then report the change and the time to captain and navigator at once. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Change of course or speed—emergency.* | Make necessary change, then report to captain change made and necessity for.<br>Report similarly when back on original course or revolutions. |
| *Chronometers* ..... | At 7.45 a. m. or 11.45 a. m., ascertain from navigator if wound. Report their condition to captain at 8 a. m., or at noon, according to the custom on your particular ship. |
| *Clocks, set at sea*..... | Request comes from navigator. Obtain permission from captain. Send to chief quartermaster (navigation) to set clocks. Notify engine room. Notify commissary officer, steward, galley. Usually done after 11 a. m. |
| *Clothes left about decks*.. | Send to police petty officer and have them placed in lucky bag. If clothes are wet when piped down obtain permission from executive to hang in a designated place and have such word passed. |
| *Clothes, piping down, when acting singly.* | Usually done at 11.30 a. m. or 1 p. m. Ascertain by messenger or signal force if dry. Obtain permission from captain. Have word passed. Notify engine room by telephone. Send to chief police petty officer to take care of clothes of men absent. Pipe down with bell. Do not allow clothes to hang about decks. |
| *Clothes, scrubbing*..... | Do not allow outside of routine hours and regular places. Men have habit of getting into corners and scrubbing when decks are not wet, thus leaving soap stains. Do not permit wet clothes to be hung in unauthorized places. A line is provided for that purpose. |
| *Collision, danger of, exists.* | Sound general alarm, one long blast of siren, warning howlers. Close water-tight doors.<br>Maneuver ship to obtain glancing blow.<br>*At anchor:* Be prepared to veer, to rig in booms and to clear the side.<br>Report to captain. |
| *Collision occurs*..... | Same signals. Notify captain, executive, engineer officer, first lieutenant, and gunnery officer of location of injury and have word passed by boatswain's mate. Sound assembly on bugle. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Colors are hoisted when first note is sounded.* | Hoist smartly and two blocks. Lower colors at first note very slowly. Never allow the colors to touch the deck or ground. |
| *Colors, boats, at boom...* | See colors of boats riding at booms unshipped, except when ship is dressed. |
| *Colors, dipping.....* | Answer dip for dip, rounding up immediately. Do not wait for other vessel to do so. See man stationed by colors in going into or out of port for this purpose. |
| *Colors, shifting.....* | Shift from *port* to *steaming* colors (a) when anchor is aweigh; (b) when last line has been cast off from dock. |
| | Shift from *steaming* to *port* (a) when anchor is let go; (b) when first line is ashore. |
| | See one set chock up before other is hauled down. |
| *Commanding officer's boat approaches flying pennant.* | Notify captain. Call guard of day and four side boys, unless commanding officer is of rank of lieutenant commander, then two boys only. Render prescribed honors when he comes on board. |
| *Court, general, or of inquiry.* | On meeting, hoist jack at yardarm and fire gun. Notify captain. When it adjourns, haul down jack; notify captain; log, giving president of court, time of meeting and adjournment and object of court. |
| *Court, summary.....* | Notify captain of both meeting and adjournment. Log, giving times, name of senior member, and names and rates of persons tried. |
| *Decks to be shellacked...* | Notify carpenter, painter, and chief police petty officer. |
| *Details, port, how called.* | Anchor watch calls relief; quartermaster calls officer of deck's relief; chief police petty officer calls buglers, ship's cooks, launches crew. Corporal of guard calls his relief and other orderlies. |
| *Discharged, enlisted man is to be.* | Obtain discharge papers from executive's office and make sure all formalities and paper work are completed. When man is ready to leave ship, give him his discharge. |
| | Report to captain. Log. |
| *Dishes reported dirty...* | Send for chief police petty officer and man in scullery. Investigate. Report to executive. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Divine service on board.* | Sound church call. Toll the bell. Hoist church pennant at same staff with ensign, but above it, lowering ensign. Permit no disturbances. Out smoking lamp. Smoking is not permitted during divine service anywhere on board ship. |
| *Draft comes on board.* | Report to captain and executive. Notify commissary steward, supply officer, and chief police petty officer.<br>Send to executive's yeoman for station billets.<br>Log names, rates, from where received, and whether bags, hammocks, and necessary papers were also received. |
| *Extra duty* | Remember that "extra duty as a punishment shall be discontinued on Sundays." |
| *Fire* | Sound general alarm. Ring ship's bell rapidly, followed by number of strokes to indicate location. Bugler sounds to fire quarters. Boatswain's mate passes word as to location of fire. Send word to engine room.<br>Notify captain and executive. |
| *Fire alarm rings, automatic.* | Have investigation made in bunkers or magazines affected by head of department concerned.<br>Report to captain and executive. |
| *Fire main leaks* | Notify first lieutenant and carpenter.<br>If necessary to shut off system, get permission from captain.<br>Notify executive. |
| *Flag officer or captain comes alongside when captain is away.* | Notify commanding officer. Have honors ready; go down gangway ladder and inform visiting officer before he leaves his boat that the captain is not on board. If a flag officer and he is entitled to a salute on departure, give it to him, as the fact that he did not come on deck is no excuse for not rendering suitable honors. |
| *Flag officer's boat approaches, flag flying.* | Call full guard and band. Have side boys, to which visitor is entitled, ready.<br>Notify captain.<br>Render prescribed honors on arrival and departure. |
| *Flag officer passes close aboard in boat flying flag.* | Call guard of day and band. Render honors as prescribed, when he passes. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Fog comes up*..... | *In port:* Notify captain. Set watch on ship's bell to sound fog signal. *Underway:* Notify captain. Start automatic whistle. A hand should be stationed by whistle in case automatic gear fails. Sound one long blast every minute. Station additional lookouts. Close all water-tight doors not necessary for communication. If in formation, get over position buoy and train search-light on it. Get signal gun ready, ammunition up and gunner's mate on watch with it. Sound fog signal immediately after ship ahead. |
| *Food, enlisted man complains of.* | Send for commissary steward and messman. Investigate. Inform commissary officer. Inform executive, if necessary. |
| *Gasoline comes on board.* | Stow 50-gallon drums on weather deck. If sufficient number of 5-gallon tins are available, empty one 50-gallon drum. Hoist powder flag. Out smoking lamp. Extinguish all unauthorized lights and fires. Notify supply officer and executive officer. |
| *Guard mail to go*..... | Call away guard boat. Send officer or petty officer to captain's office for guard mail. Send boat to division flagship to deliver mail. See guard flag in boat and officer or petty officer in prescribed uniform. Fleet routine shows time to send guard boats. |
| *Gun salutes in war time.* | During the period of the war: (a) gun salutes by United States vessels and shore stations are discontinued, except in rendering honors to foreign officials or states or in return for similar honors; (b) national salutes and salutes to port or officials of nations at war are suspended. |
| *Hammocks, procedure at.* | Sound hammocks. Have crew fall in abreast nettings. Have chief police petty officer report all up. Have silence maintained. Trice up hammock cloths and pipe down. Allow no hammocks to be taken from nettings before being piped down. See hammock stowers restow uncalled for hammocks. Have inspection made for this. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Hatches, engine and dynamo.* | Allow no men to sleep over these hatches or to hang clothes thereon. |
| *Hatch tarpaulins*..... | Never permit hatch tarpaulins to be used for anything except covering hatches. |
| *Honors, rendering, in war time.* | (See note on gun salutes.)<br>It is customary in war time not to render full side or passing honors. Acquaint yourself with the fleet orders on this subject. |
| *Land, discolored water, breakers, wrecks, etc., sighted.* | Report to captain and navigator. Get bearings. Log. |
| *Liberty party to leave*... | Pass word for liberty party to fall in. Inspect for uniform. Embark in boats, but *do not* overload. Police petty officer inspects cards as they go over the side. Inform party at what hour and place liberty expires. |
| *Liberty party returns*... | Have chief police petty officer at gangway to inspect men for intoxication or bringing back unauthorized articles. Have box ready to deposit cards.<br>Report to executive and captain the names of any men who have overstayed liberty, this preferably by written memorandum. |
| *Life-boats, readiness of*.. | Coxswains of both life-boats report boats ready for lowering at sunset. At sea coxswain of life-boat's crew of the watch reports both boats at beginning of each watch. |
| *Life-buoys tested*..... | Tested once a week and when getting underway. Done by ordnance gunner. Log. |
| *Lights, extension requested by officers.* | Request comes through chief police petty officer. Send request to captain. Send his answer to persons concerned. |
| *Lights of vessel sighted at sea.* | Take bearing by pelorus and check up to ascertain if risk of collision exists.<br>Report to captain. |
| *Lights, running*..... | Have their condition reported every half hour at sea, with the bell. |
| *Magazine inspection*.... | Daily. Ordnance gunner hands in a slip giving maximum and minimum temperatures, and reports that the magazines and powder samples have been inspected and found in normal condition. |

| INCIDENT. | WHAT DO. |
|---|---|
| | Send report to captain and log the fact, entering temperatures in the columns of the log. (Gunner also reports weekly inspection of shellrooms, flood cocks, and sprinklers, and results thereof.) |
| *Man-of-war lights*..... | Turn on when approaching an anchorage where men-of-war are likely to be found. Turn off when anchor goes. |
| | *At anchor:* Turn on when sighting *incoming* vessel with this display of lights; turn off with her. |
| *Man-of-war passes close aboard.* | Call guard of the day and band. When ships overlap sound attention; guard presents arms; band plays national anthem; hand salute by every one in sight on deck during anthem; order arms; carry on. Above done if ship is going on or has been on detached duty or is a foreign man-of-war. National anthem of passing vessel is played. |
| | Report to captain. |
| *Man-of-war reported standing in.* | Report to captain. |
| | Have above honors ready if ship passes close aboard. |
| | Log, with time and place of anchoring. |
| *Man is injured*..... | Send to sick bay for treatment. |
| | Get report from medical officer. Investigate fully how it occurred and find out whether in line of duty or not. |
| | Log *fully.* |
| | Report to captain. |
| *Man overboard. (At anchor.)* | *Day:* Away life-boat. Power boats available to rescue. Let go life-buoy if near man or heave over a ring-buoy. |
| | Notify captain, executive, and medical officer. |
| | *Night:* Same. Anchor watch mans life-boat. Turn on search-light to locate man. |
| *Man over the side*..... | Never permit a man to go over the side when underway without a bowline on him well tended on deck. |
| *Man reported missing from ship.* | Have careful search of ship and boats made by ship's police. If not found, report to captain and executive. |
| | Log that man is missing from the ship without permission from proper authority, with the time. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Man returns overtime from liberty or absence without leave.* | Send for chief police petty officer. Examine man.<br>Report to captain and executive.<br>Log, including time of return. |
| *Mast, reports at the* | When all reports are at the mast, together with *all* witnesses, including officers, inform the executive, who usually personally reports ready to the captain. In case a marine is on the report, send for the officer commanding marine guard. |
| *Meal hour delayed* | Inform commissary officer and steward and chief police petty officer. |
| *Meal hours of crew* | Meal pennant is hoisted at port yardarm only when at anchor. Boats are permitted to be absent only when on urgent public duty. All side honors are dispensed with for United States officers except courtesies by officer of the deck. |
| *Mess gear needed on mess.* | Inform first lieutenant and supply officer. |
| *Morning order book* | Contains instructions for officer of the deck having morning watch. See returned to executive's office by 8 a. m. |
| *Offense. Police petty officer brings man to the mast.* | Investigate. If serious report to executive. If the case warrants immediate punishment, send to executive and captain. |
| *Officer reports aboard for duty.* | If in uniform send for orderly and show him to cabin. Inform executive. If not in uniform, show him to a room where he may shift.<br>Log fully, including gist and file number of orders. |
| *Oil-burning ship to be fueled.* | Hoist powder flag at fore truck.<br>Engineer's force connect up flexible pipe, open filling valves to oil bottoms, etc.<br>Do not permit smoking within 50 feet of hose, tank, or vents from tanks. |
| *Oil or paint spilled on deck.* | Have wiped up at once, then carefully scraped by man or men responsible. Whitewash the spot. |
| *Orderly—time* | Detailed by executive, both at sea and in port—reports all routine occurrences, as given on sea and port routines. |
| *Overboard, throwing things.* | Permit no wood nor unpierced metal cans *nor anything that will float* to be thrown overboard at sea or in port. A ship might be trailed by these means. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Overtime men, effects of.* | Have chief police petty officer secure their bags, hammocks, and ditty boxes and stow in lucky bag for safe keeping. |
| *Pay officer brings government money on board.* | Report to captain.<br>Log the amount and from whence received. |
| *Pay officer sends government money from ship.* | Have line and buoy attached.<br>Log amount and authority for the transfer.<br>Notify captain. |
| *Pilot comes aboard.....* | Have boat line and sea ladder ready, if necessary.<br>Report to captain.<br>Log name and time. |
| *Pilot leaves ship.....* | Have boat line and sea ladder ready, if necessary.<br>Notify paymaster.<br>Report to captain.<br>Log. |
| *Ports, air, at sea, not to be opened.* | Allow no air ports to be opened at sea without permission from the captain. Have those on lower decks closed at sunset. Carpenter's mate reports condition of air ports and soundings at least twice each watch during night. |
| *Position buoy to be rigged.* | Notify boatswain and petty officers of division concerned. |
| *Prisoner sent from ship.* | Send under guard of a petty officer (armed) with necessary papers. Get papers from captain's or executive's office.<br>Log details.<br>Report to captain. |
| *Prisoner to be confined..* | Have police petty officer confine him.<br>Report confinement to captain and executive.<br>Log details. |
| *Prisoner to be released..* | Obtain captain's permission. Send to chief police petty officer to bring man to mast and then release and restore to duty.<br>Log details.<br>Report to captain. |
| *Provisions, fresh, come on board for general mess.* | Send for medical officer to inspect for quality. Inspect them yourself as to weights or have junior officer of watch or your relief do so.<br>Log amounts, contractor, weights of various provisions received, and name of inspecting officer. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Rain squall comes up....* | Pipe down aired bedding or scrubbed clothes dry, if up. Haul over hatch hoods, gun and searchlight covers. House awnings. Remove plugs from uncovered boats in skids. Slack all halliards and running gear. Prepare the ship first and then send for your rain clothes. |
| *Recorder of summary court martial wishes to deliver specification.* | Have police petty officer bring man to the mast. If under sentry's charge, obtain captain's permission.<br>Report to captain when confined again.<br>Log. |
| *Reports at 8 p. m.....* | Notify executive officer. Following departments are reported: Engineer, supply, ordnance, and construction and repair. Engineer and supply made by officers of department, not at mast. At the mast there should be the boatswain, the gunner, the carpenter and the sailmaker (or their mates) and the chief police petty officer and the captain of the fresh water hold. |
| *Reports, officer of the deck, to commanding officer.* | If commanding officer is below, make by his orderly. If commanding officer is on quarterdeck when at anchor or on bridge underway, make all reports to him in person, if at all possible to do so. |
| *Request at mast.....* | Notify executive. |
| *Salute, gun, to be fired..* | Call saluting guns' crews to quarters. Notify gunner of number of guns to be fired and whether on arrival or departure, or both. See scrubbed clothes piped down before saluting. If flag is required, see rounded up to truck in stops *beforehand,* broken with first gun, and hauled down with last, if proper to do so. |
| *Scupper lip to be put on or removed.* | Send to boatswain or petty officer in charge of side cleaners. |
| *Ship drags her anchor...* | Report to captain and executive. Notify boatswain.<br>Get steam on anchor engine and man to operate it.<br>Veer chain. Stand by the other anchor and let go if necessary, veering chain on the anchor already down.<br>In extreme cases ship will get up steam. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Ship dips to you before 8 a. m.* | Hoist colors. Answer dip and then lower colors. No ceremonies. |
| *Ship in danger of dragging her anchor.* | Put over drift lead with a seaman to attend it.<br>Get range on shore.<br>Get good compass bearings of objects on shore.<br>Get two marks on opposite sides of the ship in line with an object on shore.<br>Feel chain for tremors.<br>Keep alert for jarring of ship when starting to drag.<br>Stand by to veer chain and let go another anchor. |
| *Ship freshly painted* | Do not wash down. Under certain circumstances do not sweep down the decks. |
| *Ship in dry dock* | See fire hose connected to yard fire main.<br>Have engineer officer, gunnery officer, first lieutenant, and carpenter report all outboard sea valves closed for the night.<br>Report to captain.<br>See all fires used by navy yard workmen on board extinguished. Have chief police petty officer inspect for this. |
| *Ship underway before 8 a. m. or after sundown during daylight.* | If man-of-war, hoist colors. Do not wait for senior officer present to hoist colors. |
| *Showers, no water in, or in fresh water tanks.* | Send to first lieutenant for permission to fill tanks.<br>Notify captain of fresh water hold. |
| *Signal lights fail* | Send for electrical gunner and electrician of that circuit.<br>Notify electrical officer of ship. |
| *Signal, official, received* | Send to commanding officer.<br>See all signals recorded as soon as received.<br>Remember that "a signal and its meaning shall never be entered in the ship's log or other record." |
| *Signal, official, sent* | Must be by authority of commanding officer, unless emergency. Not signed. Send to bridge for transmission.<br>Report to captain when sent and acknowledged. |
| *Signals, uniform* | Notify captain and executive, marine officer, chief police petty officer, first sergeant, and stewards of officers' messes. Have word passed by boatswain's mate of watch. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Signal, unofficial, received.* | Deliver to officer to whom addressed. |
| *Signal, unofficial, sent...* | May be sent by your authority. Must be signed by an officer. Send to bridge for transmission. No signal may be sent direct by or to any enlisted man. |
| *Siren sounded by accident.* | If by accident a blast of siren is sounded, when whistle should have been used, sound three blasts of siren at once to open water-tight doors, unless this will confuse a steamer in sight. |
| *Sleeping near side, hatches, etc., forbidden.* | Allow no men to sleep near open hatches, or near side, where they may roll off and be injured. |
| *Stations for petty officers of watch.* | See in uniform at all times. Be especially careful that they remain at all times on station within hearing distance, unless their duty calls them away. This applies particularly to boatswain's mate and quartermaster of watch. |
| *Steam heat is wanted...* | Send to engineer officer on duty. In some cases request comes from senior medical officer. |
| *Steam launch or power boat breaks down.* | Notify executive, engineer officer, and engineer officer of watch. Find out how long she will be laid up. If accident to hull notify first lieutenant and carpenter. |
| *Steamer wants coal.....* | Have boatswain's mate of watch pass word to coal the steamer.<br>Notify engine room to send up coal. |
| *Steamer wants water....* | Send word to captain of fresh water hold to turn on the water. |
| *Steering engine to be tested before getting underway.* | Send to chief quartermaster (navigation) and machinist's mate in charge of steering engine. Have steam turned on by sending word to engineer officer on duty. |
| *Stores, canteen, come aboard.* | Notify supply officer, canteen yeoman, and chief police petty officer.<br>See means taken to prevent looting.<br>Have junior officer or relief inspect.<br>Log contractor and number of packages of various articles and by whom inspected. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Stores, general or small, come aboard.* | Report to executive. Notify supply officer and heads of departments concerned.<br>Furnish supply officer with working party to stow. |
| *Stores, commissary, come aboard.* | Notify executive, commissary officer and steward.<br>If fresh provisions, notify medical officer, who inspects for quality. Inspect for quantity or have relief or junior officer of watch do so.<br>Log fully, including amount, kind, from whom received, and name of inspecting officer. |
| *Stores, officers' messes* | Send for stewards and mess attendants of mess concerned to handle stores. |
| *Straggler from another ship comes aboard.* | Report to captain and executive.<br>Send for chief police petty officer.<br>Log fully. |
| *Sunday* | Guard and band are not paraded for United States ships or officers and no salutes are fired. Other honors are rendered. Work is reduced to a minimum. No extra duty performed. |
| *Swimming, crew requests.* | Request permission from executive, reporting temperature of water. If granted, sound "Swimming" call; call away pulling boat; see it supplied with life belts. See life-buoys and belts handy on ship. Lower booms.<br>Close all ash chutes and head discharges on that side.<br>Sound "Overboard" call when all is ready.<br>Do not permit men to hang on to boat nor to go far out from ship. |
| *Taps, extension requested.* | Have request come from chief police petty officer or other chief petty officer.<br>Ask permission from executive and from captain. |
| *Target to be rigged between stacks.* | Inform ordnance gunner. |
| *Target, towing, to be put over.* | Have ordnance gunner rig completely.<br>Have boatswain put over and hoist aboard. |
| *Tight, enlisted man comes aboard.* | Send for police petty officer or corporal of guard.<br>Report to captain and get permission to place man under sentry's charge to sober up.<br>Log. |

| INCIDENT. | WHAT DO. |
|---|---|
| | Report to executive and captain when done. If late at night, confine him and report in the morning. |
| *Time and uniform signal at 7 a. m.* | Inform captain and executive. |
| | Send change to officer's messes (servants). |
| | Notify marine officer, chief police petty officer, and marine sergeant. |
| | Pass word by boatswain's mate of watch at breakfast to shift into uniform of the day during breakfast hour. |
| *Torpedo is lost at practice.* | Report to captain. |
| | Log methods and periods of search, names of divers and lengths of time they were down. |
| *Transferred, enlisted man is to be.* | See all work preliminary to transfer completed. This includes signing pay accounts, examination by medical officer, no debts on board, that custody record is clear, and bag and hammock ready. |
| | Get transfer orders and ticket if necessary from captain's or executive's office. |
| | The man's service record and health record are forwarded by mail, or by petty officer of ship in case one goes with the transferred man. |
| *Transfer—sick man....* | Notify the medical officer when transportation is ready. |
| | See his effects and papers go with him, by hospital apprentice. These include health record, conduct report, and hospital ticket usually. If sent in ship's boat, see line on stretcher as man goes over the side. |
| | Log. |
| *Underway at hour indicated.* | Make all preparations for getting underway: Scupper lips off; steering engine tested and ready; all communications between bridge and engine room, central station and steering engine room tested; gangways rigged in or triced up; lower booms rigged in and boats hoisted. See executive before hoisting last boat. See steam on anchor engine and engine tested and ready. Test whistle, siren, signal gear, and life-buoys. Have anchor gear ready. Get permission from captain to turn over main engines when engineer officer reports ready. Be ready to heave short |

| INCIDENT. | WHAT DO. |
|---|---|
| | when ordered. Ten (10) minutes before time set, have sea details at stations, men in chains, chain tierers below and sound "Officer's call" if "All hands" are to be called. Five (5) minutes before time set, report "Ready to get underway" to captain and executive officer, sound "Assembly" and call "All hands up anchor" or call "Watch up anchor" without the "Assembly" if "All hands" are not to be called. |
| *Veer chain in an emergency.* | Send for boatswain. |
| | If the captain orders you to "Veer to . . . . fathoms" when riding to single anchor and a gale is blowing, station petty officer (carpenter's gang) by friction brake, set up on it, cast off stoppers. See all clear in chain locker, slack brake and veer to scope desired slowly. Set taut brake, put on stoppers, slack brake until strain comes on stoppers, then set up again. |
| | Report to captain ". . . . fathoms at water's edge, chain secure." |
| | Report to executive and first lieutenant. |
| | Log. |
| | In a sudden emergency, when time is precious, do above first and then report to captain, etc. |
| *Visiting party comes aboard from another ship.* | Man in charge comes aboard and asks permission for party to visit aboard. |
| | Send to executive; if permission is granted, allow party to come aboard. Man in charge has muster list which you retain. |
| | When time of visit expires, call aft by boatswain's mate and muster, return list to man in charge, and have party embark in their boat. |
| *Visitors want to come aboard.* | Obtain permission from executive; if permitted, allow to come aboard. Instruct them to keep clear of officers' quarters, not to go below second deck, nor in turrets nor conning tower. No cameras allowed. If they come aboard in shore boat, have boatman return for them. |
| | Inform chief police petty officer. |
| | Usually customary to detail men to show visitors about the ship. |

| INCIDENT. | WHAT DO. |
|---|---|
| *Water-closets choked up.* | Notify first lieutenant and carpenter.<br>Send for plumber and fitter. |
| *Weather, heavy, coming on.* | Have everything about decks well secured and extra lashings put on boats and anchors if necessary. Run life lines along the gangways. Keep men clear of places where they are liable to be washed overboard. Have forecastle and weather hatches battened down and ventilator openings secured. Get oil bags ready. |
| *Working party to be sent for stores before reveille.* | See power boats ready beforehand. Such working party should be detailed the previous evening, uniform prescribed, and all details worked out then, such as petty officers in charge, coffee, etc.<br>Require to sleep in one compartment; call in plenty of time.<br>See mustered in boat. |

## CHAPTER XI.

# NOTES ON WRITING THE DECK LOG.

### NOTES FOR OFFICER OF THE DECK ON WRITING THE DECK LOG.

a. Upon completing his watch at sea or in port it is the duty of the officer of the deck to write up the remarks in the deck log, verify the columns, and sign his name. Writing the remarks must not be deferred, but must be done while the events of the watch are fresh in the memory of the officer having the duty. It is better to enter the events as they occur so that nothing remains to be done at the end of the watch but to verify the columns and sign the remarks. It is required that the ship's log shall be a careful, detailed, and accurate record of current events. It is frequently used as evidence before courts and boards and it is consulted in many cases which come up years later, such as requests for pensions. The smooth log is the ship's official log book and is a correct and certified copy of the deck log. Officers should therefore take pains to collect all the data required and to enter it into the deck log, using the proper phraseology.

*The log must be written up before going below at sea or in port.*

b. The navigating officer has charge of the preparation of the log and, except on flagships, of the signal record book. By the Regulations he is required to carefully examine the deck log book to see that it is prepared in accordance with instructions and to call the attention of watch officers to any inaccuracies or omissions in their entries. The deck log should be copied into the smooth log book before morning quarters each day.

c. The Regulations require that the smooth log book shall be signed by the watch officers and the navigator and submitted to the commanding officer for his approval, daily before 1 p. m. The navigator, generally through his yeoman, notifies the officers that the log is ready for signature and the place where it may be found. All officers having watches should sign the smooth log before noon.

d. The columns on the left-hand page of the log are generally filled in by the quartermaster of the watch, *but the officer of the deck is responsible for their accuracy.* The officer of the deck should make a practice of checking up the quartermaster's entries, especially with regard to the wind and the weather. At sea the entries that are necessary for the dead reckoning should be filled in by the officer of the deck as the quartermaster frequently makes mistakes in entering courses steered and distances run.

e. Before standing his first watch aboard ship an officer should study up the Regulations regarding the log that are to be found in the first pages of the deck log books. The first notation to be made in the log is the name of the watch to which the remarks apply. The watches are:

Commences and until 4 a. m. (Mid watch.)
4 to 8 a. m. (Morning watch.)
8 a. m. to meridian. (Forenoon watch.)
Meridian to 4 p. m. (Afternoon watch.)
4 to 6 p. m. (First dog watch.)
6 to 8 p. m. (Second dog watch.)
8 p. m. to mid. (First watch.)

The names of the watches in parentheses are not used in writing the log. A new day always commences with the mid watch.

f. In writing the log only well-known and generally accepted abbreviations should be used. The log is the official record of the ship, and should be written in such terms as admit of no misunderstanding.

g. Various circumstances that must be logged with examples of the phraseology used are set down below:

(1) **Absence Without Leave.**—"At 9.30, after a careful search, Jones, J. R. (oiler), was declared to be absent from the ship without leave."

(2) **Accidents** to ship, including cases of grounding, or loss or injury to boats, spars, sails, rigging, or stores with extent of injury.

"At 1.15 the first motor sailing launch, Bu. C. & R. No. 202, while riding at the port quarter boom got under the head scupper and swamped. The following gear was lost: 1 set diving gear, complete, 1 boat box, 2 oars. Jones, B. E. (o. s.), was boat keeper and in the boat at the time of the accident."

NOTE.—All accidents which reduce the efficiency of the *motive power* of the ship or the strength of the battery should be carefully logged—*anything which reduces the efficiency of the ship as a fighting unit.*

(3) **Anchorages,** bearings of. When coming to anchor log the bearings of the anchorage as obtained from the navigator, the depth of water, the kind of bottom, anchor used and amount of chain out:

"At 9.30 anchored in 10 fathoms of water, starboard anchor, 45 fathoms chain. Bearings as follows: Rose Island Light 45°, Lime Rock Light 135°, ship's head 10° (all p. s. c., or p. g. c. if gyro-compass is used). Mud bottom."

(4) **Boilers in Use.**—In the first watch underway and always in mid watch at sea and in port log the boilers in use. "Steaming under boilers 1 to 12, standard speed, 15 knots." "Boilers 5 and 6 in use for auxiliary purposes."

(5) **Courses steered** and distances sailed. Entered in the columns thus:

| Hour. | Knots. | Tenths. | Reading of patent log. | Courses steered by standard compass. |
|---|---|---|---|---|
| 12.30 | 5 | 1 | 16.6 | 0° |
| 1.00 | 5 | 2 | 21.8 | 25° |
| 1.30 | 6 | 1 | 27.9 | 30° |
| 2.00 | 7 | 5 | 35.4 | 90° |

This means that from noon to 12.30 steered course 0° for 5.1 miles. Changed course at 12.30 to 25° p. s. c. and steamed 5.2 miles until 1.00 when changed course to 30° p. s. c., etc. *Do not* place the new course on the same line with the time when the course is changed. Quartermasters are very apt to make mistakes of this kind if allowed to enter the dead reckoning. In the remarks, changes of course are logged thus: "At 12.30 changed course to 25° p. s. c., pat. log reading 16.6."

If a great number of courses are steered during the watch, as when standing up a channel to an anchorage, the courses are logged as "various." "Standing up James River on various courses, captain conning."

(6) **Courts.**—When general, summary or deck courts meet on board log the time court met, time adjourned, name of the president or senior member, and list of persons tried.

"A general court martial of which Captain A. L. B. Cowles, U. S. N., is president met at 10.00 for the trial of Lieutenant C. J. Doyle, U. S. N."

"A summary court martial of which Lieut. Commander A. B. Young, U. S. N., is senior member met at 10.00, tried the following cases: Blake, J. F. (m. att., 1c.), Abele, J. T. (pvt.), and adjourned at 11.00."

(7) **Coaling Ship.**—When coaling ship the following data should be logged: The time of commencing coaling, the hourly totals, total taken aboard during the watch, time of knocking off, the draft of the ship before and after coaling, draft of the collier before and after coaling, and if coaling from barges, the numbers of the barges.

"At 5.00 commenced coaling, draft forward 26′ 2″, aft 27′ 2″, draft of collier forward 22′, aft 23′ 6″. Hourly totals as follows: 6.00—150 tons, 7.00—200 tons, 8.00—50 tons. Total taken aboard during watch 400 tons. Knocked off for breakfast at 7.20."

(8) **Desertions.**—"The following men were this day declared deserters from this ship and the U. S. Naval Service, having been absent without leave since 5 January, 1917: Smith, W. T. (c. p.), and Jones, C. L. (sea., 2c.)."

(9) **Discharges.**—"In accordance with sentence of s. c. m., published 10 January, 1917, Abbott, J. J. (m. att., 3c.), was this day discharged from

the U. S. Naval Service with a bad-conduct discharge." "James, J. J. (c. g. m.), was honorably discharged from the U. S. Naval Service by reason of expiration of enlistment."

(10) **Draft Marks.**—Before leaving and after entering port, log the draft of the ship obtained from carpenter.

"Draft of ship forward 25′ 8″, aft 26′ 5″."

(11) **Drills.**—The routine drills held during the forenoon and afternoon watches are logged in the columns. Any necessary explanations or any times recorded are placed under the remarks. Art. I 2605 requires that the *time* required at *collision drill* to close the water-tight doors and hatches and to get the collision mat ready shall be entered in the log. This is usually recorded as follows:

"Sounded collision quarters at 9.30. Divisions reported ready as follows: 1st, 3 min.; 2d, 3-30; 3d, 3.00, etc., collision mat, 3 min." The executive officer's yeoman usually takes the times various divisions are reported and gives the slip to the officer of the deck.

(12) **Enlistments.**—Log all men that are enlisted or re-enlisted aboard during the watch.

"Stone, C. D. (sea.), this day enlisted (re-enlisted) in the U. S. Naval Service for 4 years' general service."

(13) **Evolutions or Exercises:**

"At 8.15 executed ships right 90° course 180° p. s. c."

"At 8.45 formed column of divisions course 180° p. s. c."

"At 9.00 opened fire on enemy cruisers."

(14) **Getting Underway.**—State purpose and authority. (This information is received from captain.)

"At 3.15 got underway to hold torpedo practice in obedience to commander-in-chief's letter, 3501-12 of 2 January, 1916."

(15) **Injury of Personnel.**—Log full particulars of every injury or accident however slight among officers, crew, or passengers.

"At 7.45 while engaged in coaling ship, Ames, A. B. (sea.), suffered a compound fracture of the right leg; he was struck by a full coal bag which fell into the lighter, due to strap carrying away." A memorandum concerning the injury should be obtained from the medical officer.

When an enlisted man becomes disabled due to injuries received in line of duty he applies for a pension. The log is consulted by the Pension Board, and if the particulars of the injury are found there as claimed, the man gets the pension.

In case of injury to navy yard workman while on board, he should be sent to sick bay and given medical attention by the ship's surgeon. The medical officer of the navy yard and also the injury officer should be immediately

notified and all the circumstances of the accident with the names of witnesses and the extent of the injury received should be entered in the log.

(16) **Inspections.**—The captain usually makes his weekly inspection of the lower decks and storerooms on Friday afternoon, and the inspection of the upper decks and crew on Saturday forenoon. These are logged as follows:

"At 2.30 the captain in company with the medical officer and heads of departments concerned inspected the lower decks, storerooms, and holds."

"At 9.30 mustered at quarters, absentees ————. The captain inspected the ship and crew."

(17) **Inventory of Equipage.**—Log dates of commencement and completion of each inventory of equipage and supplies. "The supply officer commenced yearly inventory of equipage and supplies this date." "Completed yearly inventory of equipage and supplies this date."

(18) **Leave.**—Log the time of going and time of returning of all persons attached to the ship. "Lieutenant A. B. Castle left the ship on 4 days' leave." "Kennedy, J. F. (f., 1c.), returned from 10 days' leave." In case a man returns overtime from leave, the time he came aboard should be noted.

(19) **Lighting Fires.**—Log every occasion when fires are lighted under a boiler or allowed to die out.

"At 5.07 lighted fires under boiler No. 6 and at 7.30 let fires die out under boiler No. 5."

(20) **Magazines, Inspections of.**—Daily log the fact that the magazines have been inspected, the condition thereof and of the smokeless powder samples. The slip is turned in by the gunner and the fact is reported to the captain.

"Inspected magazines and powder samples, condition normal." Record the maximum and minimum temperatures in the place provided in the columns. Once each week, generally Thursday, the weekly inspection of shellrooms, flood cocks and sprinklers is made. Log as follows: "Inspected shellrooms, tested magazine flood cocks and sprinkling system and found them in good condition."

(21) **Moon Rises or Sets.**—Record time of rising or setting of moon if observed. This data may be of use in time of war as it influences the visibility of objects at night.

(22) **Movements of Ships.**—Log the naval vessels that stand in, get underway, or stand out during the watch; if in foreign port log arrival and departure of mail steamers: "*Delaware* stood in and anchored in berth assigned at 1.45." "At 4.40 *Wyoming* got underway and stood out." "The *Connecticut* stood in and at 1.00 anchored 500 yards from this ship, bearing 150° p. s. c." "At 3.15 S. S. *Segurancia* stood in with mail."

(23) **Navy Yard Work.**—It is the custom in navy yards to log the number and rates of the yard workmen aboard and the job orders on which they are working. "Navy yard workmen on board from 8 a. m. as follows: J. O. No. 5516J, six machinists, four helpers. J. O. No. 5518J, three ship fitters and one helper." The data required for this entry is obtained from the yard leading men.

(24) **Overtime from liberty:** When men return to the ship over leave the fact should be logged.

"At 9.00 the following named men returned two hours overtime from liberty: Jones, J. J. (sea., 2c.), Smith, S. L. (c. p.)."

(25) **Passengers.**—Log the names of all passengers with the time of coming aboard, departing, and the authority therefor. "By permission of the Secretary of the Navy, letter No. 2707-6 of 1 December, 1916, Mr. A. B. Post, of the *New York Herald,* came aboard at 2.20 as a passenger for Guantanamo, Cuba." "Mr. A. B. Post, a passenger, left the ship at 1.15." (The times when first coming aboard and leaving finally only to be logged.)

(26) **Passing lighthouses** and other aids to navigation. When coasting, steaming in a river or bay, or in entering and leaving port, log the time of passing *principal* lights or aids to navigation, their distance abeam and the side on which passed unless this last is obvious. "Standing up Chesapeake Bay on course 3° p. s. c., speed 12 knots. At 6.04 passed Wolftrap Light, distance abeam 2½ miles." "At 1.05 passed Cape Charles Light, ship abeam, port side, distance 1 mile."

(27) **Punishments.**—Article R 1433 requires that "entries in the log regarding punishments shall include the name, rank, or rating of the offender, the date and nature of the offense, and the kind and degree of punishment. The date of every suspension, arrest, confinement and restoration to duty shall also be entered upon the log book."

The most frequent occurrence of punishment is the daily award by the commanding officer at the mast.

"The captain held mast and awarded punishments as follows: Smith, R. C. (w. t.), absent over leave 36 hours, s. c. m." "Clark, H. S. (sea.), not scrubbing hammock, 5 hours' extra duty."

"Published following transcript of s. c. m. in case of Blake, R. A. (sea.). Offense, drunk on board ship, 3/2/17, not having been on liberty. Sentence, to lose pay amounting to thirty dollars ($30.00). Approved by commanding officer 3/16/17. Loss of pay remitted accordance Article I 4893, 1913, approved by s. o. p. 3/20/17."

"By order of the captain (commanding officer) Ensign R. S. Blake was suspended from duty for 10 days for neglect of duty while officer of the deck 3/20/16."

NOTE.—When the officer ordered to command the ship holds mast, orders men in confinement, or makes inspections of the ship or personnel it is customary to use the term "captain" in logging the fact. When, however, these duties are performed by some other officer, due to the absence or disability of the captain, it is customary to use the term "commanding officer."

When sentences of summary or deck courts are carried into effect, log: "By order of the captain (commanding officer), Fait, L. A. (q. m., 3c.), was placed in solitary confinement for 10 days on bread and water, with full rations every third day, pursuant to sentence of s. c. m. (deck court)."

(28) **Quarters, Absentees.**—Log as follows: "At 9.15 mustered at quarters. Absentees, Smith, A. B. (sea.), King, N. L. (f., 2c.)."

(29) **Reporting for Duty.**—Log the names, rank or rating of all persons ordered to or detached from the ship.

"Received from receiving ship at New York the following named men with bags, hammocks, and necessary papers: (insert names and rates of men). In case any bags, hammocks, or papers are missing the fact should be logged.

"Lieut. A. B. Smith, U. S. N., reported on board for duty in obedience to Department's Order No. 2345-16, of 12 January, 1916."

"Ensign A. L. Hemp, U. S. N., was detached from duty on board this ship and ordered to report to the senior officer present afloat for duty on board the *Michigan,* Department's Order No. 3506-16, of 12 January, 1916."

(30) **Stores Received.**—The only stores logged are commissary stores, coal, and ammunition.

"Received in the supply department from Jones & Smith the following provisions: 200 lbs. fresh meat, 500 lbs. fresh vegetables. Weighed and inspected by Ensign Brown."

NOTE.—By Article 2241, paragraph 12, U. S. N. I., it is required "that all provisions delivered on board by a contractor be inspected upon delivery by a commissioned officer (that is to say, the officer of the deck or by his relief or the junior officer of the watch—preferably the former) who shall personally, and without delegating this duty to another, ascertain the exact quantity of each article received and certify the fact over his official signature and at once deliver said record to the supply officer." Paragraph 13 of the same article requires "whenever provisions are delivered on board by a contractor an entry shall be made in the ship's log showing the contractor's name, the exact quantity of each article delivered, and the name of the officer making the inspection."

The total amount of coal taken on board is logged in the watch at the time of completing, thus: "Total amount of coal taken on board 1560 tons." This is in addition to the hourly totals.

"Received from Naval Ammunition Depot, Iona Island, N. Y., the following ammunition: 100 12" A. P. Blind projectiles, 100 charges (200 tanks) 12" s. p. Index 404."

(31) **Sentry's Charge.**—When a man is placed under sentry's charge for safekeeping or for any other purpose the fact should be logged.

"By order of the captain (commanding officer) Smoot, L. G. (sea.), was placed under the sentry's charge to await action."

(32) **Salutes.**—Log all salutes fired by any men-of-war present.

"At 10.30 H. M. S. *Bristol* stood in and fired salute of 17 guns, U. S. ensign at the fore, which was returned by the U. S. S. *Wyoming* gun for gun."

"At 11.15 the *Delaware* fired salute of 13 guns, which was returned by the *Florida* with 7 guns."

"The commander first division returned the call of the captain, and upon his departure a salute of 13 guns was fired."

(33) **Sighting Land and Aids and Dangers to Navigation.**—Log, *when at sea,* the time of sighting and the bearing of all aids to navigation, also time of losing sight of a light or landmark.

"At 1.05 sighted Cape Charles Light, bearing 270° p. s. c., distant about 15 miles."

If the ship's head cannot be readily obtained from the columns of the log the heading p. s. c. should also be inserted.

"At 7.50 passed derelict schooner *J. B. Paler,* dismasted and awash. Lat. 38° 40′ North, Long. 75° 00′ West.

"At 8.10 lost sight of Cape Maysi Light, bearing 182° p. s. c."

(34) **Soundings.**—All important soundings taken with the sounding machine or deep sea lead should be logged with the time taken, character of bottom, and reading of patent log. "Took soundings every hour as follows: 1.00, 59 fathoms, fine gray sand; 2.00, 63 fathoms, sand, broken shell; 3.00, 65 fathoms, mud; 4.00, 70 fathoms, broken shell." The reading of the patent log in this case was not necessary as it could be obtained on the hour from the columns.

(35) **Steam and Revolutions.**—While underway at the end of each watch log the average steam and revolutions for the watch. This is obtained from the engineer officer of the watch.

"Average steam 180, average revolutions 120."

(36) **Tide.**—When at anchor in a tideway log to which tide the ship is riding, the time of swinging, and the direction the stern swings.

"Riding to flood. At 3.15 commenced swinging to ebb, stern to starboard. Finished swinging at 3.45."

(37) **Time.**—Any changes in the setting of the deck clock is always noted in the log. The navigator determines the amount of change necessary and

gives a slip to the officer of the deck; permission to make the change is obtained from the captain, and the clocks are usually set by the chief quartermaster.

"At 11.20 set clocks back 15 minutes."

(38) **Transfers.**—"Transferred to the receiving ship at New York the following named men with bags, hammocks, and necessary papers: (insert names and rates of men)."

(39) **Visits of Ceremony.**—Only official visits are logged. The captain or officer making the call furnishes the officer of the deck with the information.

"The commanding officer of the *Virginia* called on the captain."

"The captain called on (or returned the calls of) the commanding officers of the *Virginia* and *Louisiana.*"

"The first division commander called on the commander-in-chief."

(40) **Vessels in Port.**—Upon anchoring in a port, log names of all men-of-war in sight.

"At 9.30 anchored, etc. Found following ships present: *Louisiana, Delaware,* etc."

(41) **Weather, Wind, and Sea.**—Article I 1877 (j) says, "The state of the weather and the sea will be entered in the columns of the log, but will not be duplicated in the watch officer's remarks unless circumstances render it necessary to a proper interpretation of the columns."

Under the "Directions for Keeping the Ship's Log," paragraph 16, it is required that "in addition to the records made by the proper symbols in the respective columns . . . . the general character and appearance of the weather, the kind of clouds, and the directions from which they move, and the state of the sea during each watch, will be recorded in the general miscellaneous remarks in popular and professional language."

These requirements seem contradictory in part and a compromise is necessary. The following should be entered in the remarks: Any unusual weather, and any signs of a change; all indications of the approach of bad weather, including storm signals displayed ashore, stating directions, etc.; any condition of the weather or sea which would interfere with the speed of the ship, or her efficiency as a fighting machine. It will be noted that in the columns there is a place for "State of Sea," but none for the direction, and this latter is important as it does not always coincide with the wind and may knock down the speed, interfere with the use of certain guns, interfere with the rapidity of fire, and by causing rolling or pitching interfere with the efficiency of the fire. In hazy or foggy weather the estimated visibility should be recorded. These items would be very important in time of war and recording them should be made a matter of habit.

## Sample Logs.

**At Anchor:**

(Ship with the fleet in Hampton Roads.)

Commences and until 4 a. m.

Riding to ebb. At 3.05 commenced swinging to flood, stern to starboard. Finished swinging at 3.30. Boilers Nos. 1 and 2 in use for auxiliary purposes.

A. B. C. ———, Lieutenant, U. S. N.

4 to 8 a. m.

Riding to flood. At 4.30 Jones, A. B. (sea., 2c.), returned, having been absent without leave since 1 January, 1916. By order of the captain he was placed under the sentry's charge for safekeeping. At 7.00 started fires in boilers Nos. 3 to 10, inclusive.

D. E. F. ———, Lieutenant, U. S.N.

### Examples of Watches While Ship is Underway.

**Getting Underway and Standing Out:**

8 a. m. to meridian.

Riding to flood. At 9.15 mustered at quarters. Absentees Samuels, J. P. (f., 2c.), and King, L. J. (m. att., 3c.). Made preparations for getting underway. Draft forward 25′ 11″, aft 28′ 2″. At 10.00 got underway for tactical exercises in obedience to commander-in-chief's signal, formed column, natural order, and stood out, the captain conning. Standard speed, 15 knots. Boilers in use, Nos. 1 to 10. At 10.15 passed Thimble Shoal Light close aboard on port hand. At 11.15 passed Tail of the Horseshoe lightship abeam, distance about 1 mile. At 11.45 passed Cape Henry Light abeam, distance 1 mile, and set course 135° p. s. c. for Cape Henry entrance whistling buoy. At end of watch Cape Henry Light bore 315° p. s. c., distance 5 miles. Average steam 180, average revolutions 120.

B. N. M. ———, Lieutenant, U. S. N.

**Watch Underway with Fleet:**

Meridian to 4 p. m.

Steaming in column, natural order, on course 350° p. s. c., speed 12 knots. At 1.00 formed line of squadrons to the front, guide right. At 1.15 opened interval to 10,000 yards for gunnery exercises, and at 2.15 closed interval to 4000 yards. At 2.30 formed line of divisions to the front, guide right. At 3.45 sighted Block Island S. E. End Light House bearing 290° p. s. c., distance about 12 miles. Average steam 175, average revs. 120.1. At end of watch Block Island S. E. End Light bore 270° p. s. c., distance about 11 miles.

C. K. J. ———, Lieutenant (J. G.), U. S. N.

**Watch Coming into Port:**

4 to 6 p. m.

Steaming in column, natural order, at 12 knots, on course 15° p. s. c. At 4.15 passed Brenton's Reef lightship close aboard to starboard and changed course to 20° p. s. c. Stood into Narragansett Bay on various courses, the captain conning, and at 5.30 anchored in berth assigned in 10 fathoms of water, starboard anchor, 45 fathoms chain, mud bottom. Bearings of anchorage, Rose Island Light, 85° p. s. c.; Gull Island Light, 60° p. s. c.; Fort Adams Light, 160° p. s. c.; ship's head 220° p. s. c. (Dev. 1° E.). Draft forward 27′ 8″, aft 28′ 6″. The captain called on the first division commander. Average steam 183, average revolutions 109.5. At 5.45 let fires die out under boilers Nos. 3 to 10, inclusive.

L. D. M. ———, Lieutenant, U. S. N.

6 to 8 p. m.

Riding to flood. Cook, T. G. (m. att., 3c.), was this day discharged from the Naval Service with a bad-conduct discharge in accordance with the sentence of s. c. m. previously awarded.

P. J. M. ———, Ensign, U. S. N.

8 p. m. to mid.

Riding to flood. At 11.00 commenced swinging to ebb, stern to port. Finished swinging at 11.30.

J. H. B. ———, Lieutenant, U. S. N.

CHAPTER XII.

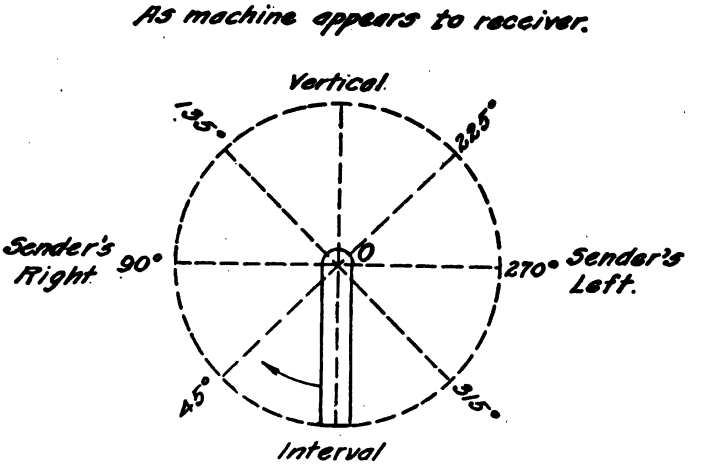
## AIDS TO LEARNING SIGNAL CODES.

### SEMAPHORE CODE.

See pages 114 to 118, Deck and Boat Book.

In the semaphore code the symbols representing the letters in general follow a regular sequence, but there are certain exceptions.

In order to show the system followed in developing the alphabet, use will be made of the semaphore machine and the different positions will be designated as shown in the sketch.




The machine has two arms pivoted at " O," and there are eight positions as shown.

In making the letters from " A " to " G " one arm remains stationary at " Interval," while the other arm starts at 45° for " A " and, moving clockwise, occupies successively the positions of 90° for " B," 135° for " C," vertical for " D," 225° for " E," 270° for " F," and 315° for " G."

In the second series (which omits " J ") the stationary arm moves up to 45°, while the other arm starts 45° in advance of it at 90° for " H " and, moving clockwise, occupies the positions of 135° for " I," vertical for " K," 225° for " L," 270° for " M," and 315° for " N."

In the third series one arm moves up to 90° and remains stationary, while the other arm starts at 135° for " O " and, moving clockwise, occupies the position of " Vertical " for " P," 225° for " Q," 270° for " R," and 315° for " S."

The fourth series is not in alphabetical sequence and consists of "T," "U," "Y," and "Signals follow." In this series the stationary arm moves up to the position of 135°. The other arm starts at the "Vertical" for "T" and, moving clockwise, occupies successively the positions of 225° for "U," 270° for "Y," and 315° for "Signals follow."

The fifth series is also irregular and consists of "Letters follow," "J," and "V." In this series the stationary arm moves 45° to the vertical and there remains fixed. The other arm starts at 225° for "Letters follow," moves clockwise by 45° increases and occupies successively the positions of 270° for "J," and 315° for "V."

The sixth series is in alphabetical sequence, but consists of only "W" and "X." The stationary arm again moves through 45° from that occupied by last series and remains fixed at 225°. The other arm starts at 270° for "W" and moves to 315° for "X."

In the last letter "Z," the stationary arm advances to the 270° position and the other arm is again 45° in advance of it, at 315°. The movable arm can advance no more without duplicating a symbol already employed, therefore all the symbols that can be made with two arms and eight positions have been utilized. The symbol "Letters follow" indicates that the message following will be spelled out. The symbol "Signals follow" indicates that the meanings of the groups of letters following must be looked for in a signal book.

## SEMAPHORE CODE WITH HAND FLAGS.

In order to learn the code with hand flags quickly, divide the alphabet into six groups of letters as follows:

| | | |
|---|---|---|
| Group 1, "A" to "G." | Group 2, "H" to "J." | Group 3, "K" to "N." |
| Group 4, "O" to "S." | Group 5, "T" to "V." | Group 6, "W" to "Z." |

The first letter of each group is used as a key letter for the group.

In the first group, one arm only is in use at a time. Starting with the flags in position of "Interval" to make the letters "A" to "D," move the right arm by 45° increments clockwise to the vertical. To make the letters "D" to "G," start with the left arm at the vertical and continue the clockwise motion by 45° increments to the left to the 315° position. Note that "D" may be made with either the right or left arm.

In making "Interval" the flags are crossed in front of the body (withdrawn from view). While making any letter of the first group, the flag not in use must be kept at the position it would occupy at "Interval."

To make "H," the key letter of the second group, the right arm is at the 90° position and the left arm at the 45° position. To make "I," keep fast the left arm and move the right arm through 45° up to the 135° position. For "J" the right arm is vertical and the left arm is at the 270° position. This letter does not follow the sequence.

The third group, "K" to "N," is regular. In making the letters of this group the right arm remains in the 45° position, while the left arm starts at the vertical ("K") and moves clockwise by 45° increments to the 315° position ("N").

Note that in "L" the arms are diagonally across the body and in "N" they are raised 45° to the right and left from "Interval." These letters are easy to fix in the memory and from them the other letters of the group may be easily recalled. "K," the key letter of the group, should be also fixed.

The fourth group, "O" to "S," is also regular. The right arm in this group remains at the 90° position, while the left arm starts at 135° for "O" and moves clockwise by 45° increments to the 315° position, the letter "S."

Note that in the semaphore alphabet, page 116, Deck and Boat Book, under "Hand Flags" the letter "O" is not properly made. If made in this manner it can easily be confused with the letter "I." The *height* of the *shoulders should be the dividing line;* so if necessary to make "O" with the *right* arm at 135°, the left arm should be straight across the body with the flag the height of the *right shoulder.* In this group also, note that "P" is the opposite of "J," and that in making "R" the arms are horizontal. These letters are easy to fix in the memory and will assist one in remembering the others of the group.

A great many beginners have trouble in distinguishing between the letters "M" and "S." In sending, if one remembers the word "Emma," it will assist. In making "M" the right arm is in the position of "A."

In the fifth group, "T," "U," and "V," the first two letters follow the sequence, but "V" is irregular. In making "T" the right arm is at 135° and the left arm is vertical. To make "U" move the left arm clockwise through 45°. To make "V" move the right arm to the vertical and the left to the 315° position. Of this group "U" is easy to remember because it resembles the letter "U." In making "V" remember the right arm is *vertical* and that "V" is the opposite of "K."

The sixth group "W" to "Z," is irregular. "W," the key letter, is made with the left arm at the 225° and the right arm at the 270° position, *at the height of the left shoulder.* To make "X," drop the right arm through 45° to the 315° position. From "X" to make "Y" drop the left arm to the horizontal and carry the right arm across to the 135° position. From "Y" to make "Z," keep the left arm at the horizontal and carry the right arm across the body again to the 315° position.

Note that "W" is the opposite of "O," "X" is the opposite of "I," and "Z" is the opposite of "H." The semaphore letter "X" looks like the right half of the alphabet letter "X," and the semaphore "Y" looks like the upper half of the alphabet letter "Y" *lying down.*

The remaining *fixed* symbols of the semaphore code are "Letters follow," the opposite of "T," and "Signals follow," the opposite of "L."

The *moving* symbols are:

"A," agitated for "Error."

"O," agitated for "Interrogatory."

"U," agitated for "Cornet."

2 chop-chop signals for "Double interval" (end of sentence).

3 chop-chop signals for "Triple interval" (end of message).

In making the chop-chop signals place both arms at the right horizontal and move them up and down a few times in a slow cutting motion using a full sweep, returning to "Interval" between the successive chop-chop signals.

The semaphore code is the most rapid method of transmitting spelled-out visual signals. *Speed* must give place to *accuracy,* however, in this as in other methods of signalling. In sending, the flag must be held in the extension of the arm. To secure this the index finger should point along the staff. Be careful to place the arms at the proper angles. Look along the arms at first, until sure that the correct positions are assumed. Never start to move from the position assumed for one letter until sure in your own mind how to move the arms to make the next letter. As long as the arms remain in position for the last letter, no mistake can be made; but if the arms are moved aimlessly while thinking how to make a letter, several letters may be made unintentionally. Think up each letter *before moving the arms* and then move quickly and with decision.

## THE DOT AND DASH CODE.

The Dot and Dash Code comprises the alphabet and numerals of the International Morse Code.

### Alphabet.

| | | |
|---|---|---|
| A ·— | J ·——— | S ··· |
| B —··· | K —·— | T — |
| C —·—· | L ·—·· | U ··— |
| D —·· | M —— | V ···— |
| E · | N —· | W ·—— |
| F ··—· | O ——— | X —··— |
| G ——· | P ·——· | Y —·—— |
| H ···· | Q ——·— | Z ——·· |
| I ·· | R ·—· | |

### Numerals.

| | | |
|---|---|---|
| 1 ·———— | 5 ····· | 9 ————· |
| 2 ··——— | 6 —···· | 0 ————— |
| 3 ···—— | 7 ——··· | |
| 4 ····— | 8 ———·· | |

**Memory Aids.**

This code is used in the following methods of signalling in the navy and is very important: Wigwag signals (day and night), Occulting Light (day and night), Sound signals (day and night), Very system (night), and Radio.

By *opposite* is meant that a *dash* replaces a *dot* and vice versa. Note that all the letters in the left hand column are opposites of those in the right.

(Read down in groups.)

| *Increasing one dot.* | | *Increasing one dash.* | |
|---|---|---|---|
| e | · | t | — |
| i | ·· | m | —— |
| s | ··· | o | ——— |
| h | ···· | Cornet | ———— |
| | | | |
| n | —· | a | ·— |
| d | —·· | w | ·—— |
| b | —··· | j | ·——— |
| | | | |
| a | ·— | n | —· |
| u | ··— | g | ——· |
| v | ···— | Letters | ———· |

Opposites (read across).

| | | | |
|---|---|---|---|
| c | —·—· | Code interval | ·—·— |
| f | ··—· | q | ——·— |
| k | —·— | r | ·—· |
| l | ·—·· | y | —·—— |
| p | ·——· | x | —··— |
| z | ——·· | Signals | ··—— |

Notice that leaving out *a*, the first three (*b, c, d*) and the last three (*x, y, z*) begin with a *dash*.

There are certain other combinations that may be of assistance, such as:

*g. w.* (George Washington)—*g* is *w* reversed.

Ky. (Abbreviation for Kentucky)—a dash added to *k* (—·—) makes *y* (—·——).

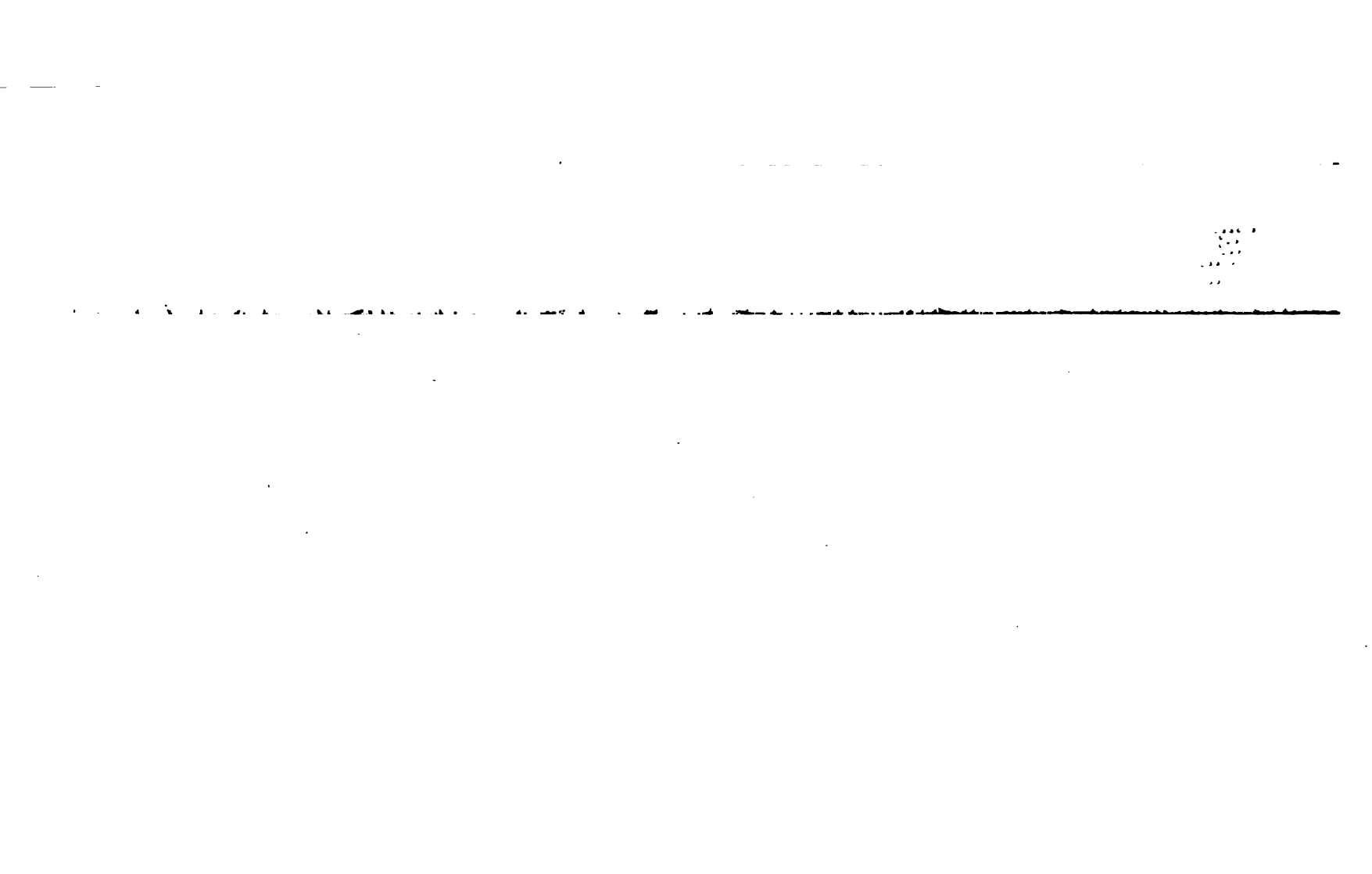
*r. l.* (Robert E. Lee)—a dot (*e*) added to *r* (·—·) makes *l* (·—··).

If it is found difficult to remember certain letters, a simple word may be formed that will be of assistance: for instance, *p* (·——·), remember *pan* (*p* is made up of the letters *a* and *n*), *f* (··—·), fin; *j* (·———), jam; etc.

Make up your own combinations, certain initials that are familiar to you may help.

The letters of the code may be memorized in half an hour, *but it is necessary to review them frequently or they will be forgotten.*

I.



## CHAPTER XIII.

# THE MOORING BOARD.*

(Chapter V, Grant's School of the Ship, revised by Lieut. Commander W. C. I. Stiles, U. S. Navy, and Lieut. Commander J. R. Morrison, U. S. Navy.)

1. The Mooring and Maneuvering Board (Plate I) is issued to naval vessels as Chart No. 2665 and consists of a blank chart on which are marked 10 concentric circles one inch apart, radial lines drawn at 10° intervals, and horizontal and vertical lines forming one-inch squares drawn tangent to the circles. The outer circle is graduated in degrees from 0 to 360, commencing at the north point, and an inner circle is graduated in degrees which are numbered from the south point. The latter is very useful in laying off reverse bearings. The horizontal and vertical lines passing at right angles through the center of the circles are subdivided into tenths of an inch. At the top and bottom of the board a number of scales (not shown in Plate I) are laid off to facilitate accurate measuring of distances to the scale selected for the problem. The distance between the circles (one inch) may be taken to represent any unit, as 100 yards, 1000 yards, one mile, or any other distance.

2. The board is a conveniently marked, large scale chart and it is essential to the rapid, graphical solution of maneuvering problems on board ship requiring accuracy and involving the use of rectangular and circular units of measurement. The board furnishes a rapid and accurate means for plotting the position of a ship by means of bearings and distances and in particular lends itself to the ready determination of courses. Bearings are observed either by the standard compass or the pelorus, while distances are obtained from the range finder or from the stadimeter. *The point observed* is the foremast of the ship upon which the evolution is based, and this point is therefore plotted at the center of the board. The *point plotted on the observing ship* is assumed to represent the center of her bridge, as the distances from this point to the positions of the observers are so small that they may be neglected.

* The method used in the Maneuvering Problems for obtaining course and speed first appeared in print in the November number of the Naval Institute Proceedings in 1917 in an article by Captain G. H. Burrage, U. S. Navy, entitled "Notes on Handling Ship." This method was developed independently by Lieut. Commander W. C. I. Stiles, instructor in the Seamanship Department, in the fall of 1918 while studying the Mooring Board with a view to the revision of the chapter on Mooring Board taken from Grant's School of the Ship.

## APPROACHING AN ANCHORAGE.

3. In anchoring problems in the fleet, the position in which to drop the anchor is usually determined by bearing and distance from another ship, and this position is plotted on the mooring board. From this point the track of the ship to the anchorage is laid down on the board either from her position at the time or from one in which she will soon be. In laying down the course to the anchorage, shoal spots must be given a wide berth, and it is frequently necessary to plot the position of land or shoals on the mooring board in order to be certain of a safe course to the anchorage. During the approach, simultaneous bearings and distances of the reference ship are taken at frequent intervals by two observers and the track of the ship thus checked. If the actual track of the ship does not agree with that laid down, the course of the ship is altered a few degrees to bring her back on the line, or a new line to the anchorage plotted.

4. The direction in which a current is setting can be obtained approximately from observing the headings of ships at anchor or the direction in which buoys are inclining. A moderate set across the course of the ship can be allowed for in the course, but if there is a strong current running it is better to approach the anchorage directly against the current.

5. The officer conning the ship should, if practicable, be other than the one doing the plotting. If one officer attempts to do both he is liable to become so engrossed in the plotting that he fails to observe accurately the way the ship is making through the water and the general conditions with reference to weather, current, dangers to navigation and the position of other ships at anchor or under way.

6. It will be noticed that the data necessary for anchoring consist of two factors, the bearing and the distance. Both of these must be correct when the anchor is let go. The course for the direct approach should be selected, if practicable, so that when nearing the anchorage either the bearing or distance will remain constant or nearly so, while the other factor changes rapidly. Attention can then be centered on the one changing more rapidly and when this factor is correct the command for letting go can be given.

In laying down the course to the anchorage, a distance of at least 500 yards should be allowed after completing a turn to the point for letting go the anchor. This distance is necessary in order to steady down on the course and to adjust the position of the ship on the line.

7. In order to be sure of approaching the anchorage with the proper amount of way on for anchoring or mooring, the retardation curve should be consulted beforehand. From this curve can be obtained the distance necessary for a ship to run after the engines are stopped to reduce the speed, from that corresponding to the revolutions, to any desired lower

speed. The speed generally used for anchoring is three or four knots and that for mooring about six knots. Knowing the speed of the ship in approaching and obtaining from the retardation curve the distance necessary for her to partially lose her way, the engines can be stopped at the correct distance from the anchorage and the ship will slide into her berth at the desired speed. The *speed of the ship over the ground* is the speed required to be known in anchoring. An allowance must therefore be made for current when obtaining the data from the retardation curve. The strength of the current in knots per hour is subtracted from or added to the speed desired in anchoring or mooring, depending on whether the set is in the direction of the ship's course or against it.

## ANCHORING PROBLEMS.

By LIEUT. COMMANDER J. R. MORRISON, U. S. Navy.

8. To solve anchoring problems, assume the foremast of the ship on which the maneuver is based at the center of the board, then plot the position of her anchor; from this point lay off the bearing and distance of your own anchor and plot the track of the ship from her present position to her anchor. Lay off from the position of the anchor, back along the course, the distance on your ship from the hawse-pipe to the bridge. This will give the position in which your bridge should be when the anchor is let go.

9. Usually the ship at anchor will signal the bearing and distance of her anchor and these are always considered as taken *from the foremast.* If she does not, it will be necessary to assume that the ship is anchored with the same scope of chain your ship is directed to use; and, from the direction in which she is heading together with the state of the wind and tide, to assume the bearing and distance of her anchor. Ordinarily a ship will ride either to the current or to the wind with her anchor nearly ahead. When the tide and wind are not acting in the same direction a ship's heading will depend on which is the stronger, and experience is necessary to form a correct estimate. Battleships ride to the tide principally, due to the small extent of surface exposed to the wind in comparison with their underwater surface. The distance estimate is made up of two parts: the distance from the ship's foremast to her hawse-pipe, and the distance from the hawse-pipe to her anchor. The first part is usually known. For the latter part, knowing the amount of chain out, a rough correction is made, taking into account the depth of water and the probable tautness of her chain under existing conditions.

## PROBLEM 1.

A ship standing toward an anchorage desires to anchor in a prescribed position from a ship at anchor. No current.

### EXAMPLE.

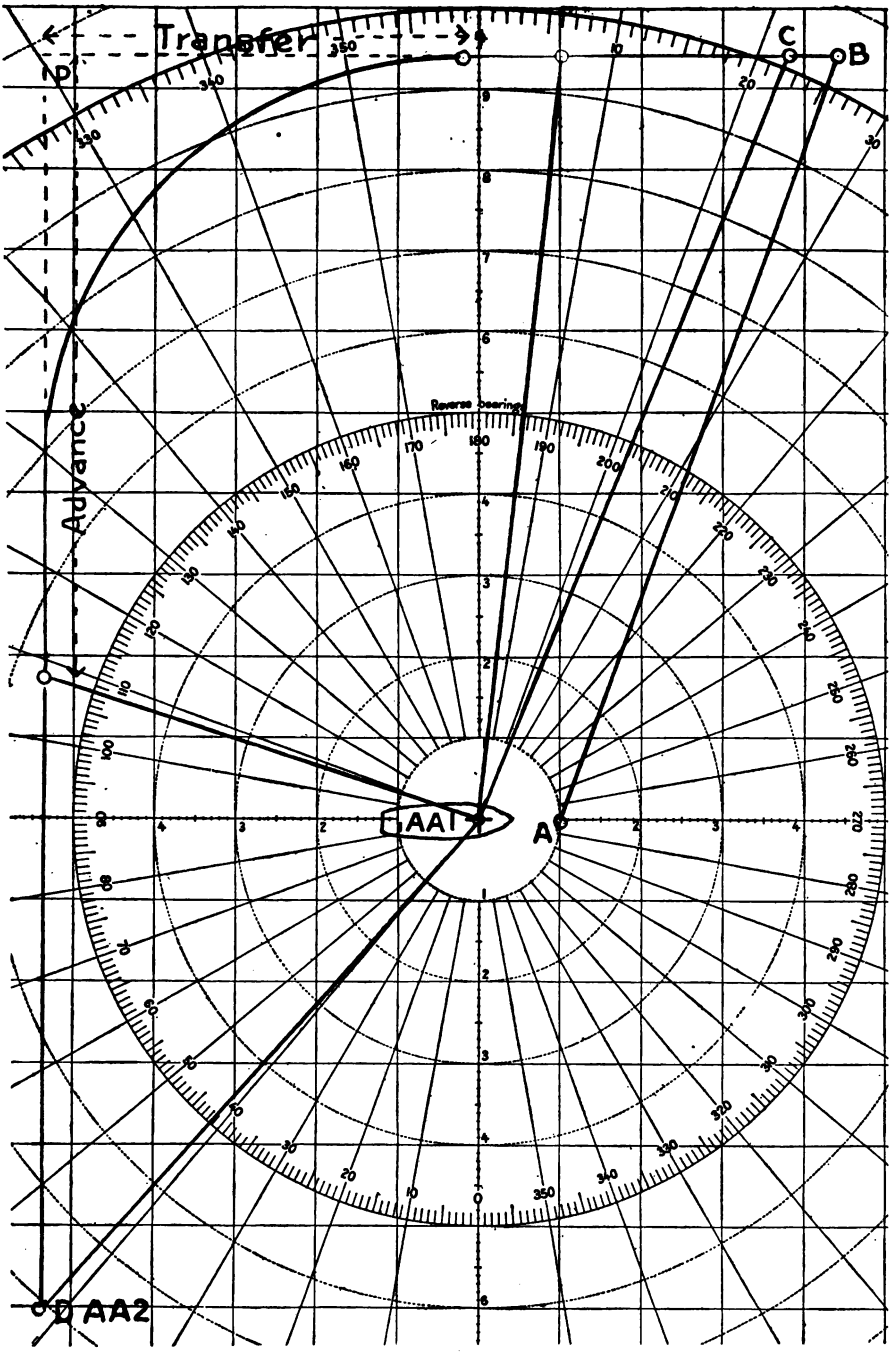
*AA2* standing towards the flagship *AA1* is directed to anchor with *AA1* bearing 200°, distance 1000 yards, 45 fathoms of chain. *AA1* signals that her anchor bears 90° and is distant 100 yards. *AA2*, now on course 0°, has *AA1* bearing 42°, and is distant 810 yards. *Required:* The data necessary for *AA2* to carry out her orders.

### SOLUTION.

To accomplish this *AA2* must know (a) at what point to put her rudder over so that when allowance has been made for her advance she will be heading directly for her anchorage; and (b) at what point to let go her anchor.

Plot the position of *AA1's* foremast in the center of the board. Using the largest scale that will get all positions on the board, consider the circles for this problem 100 yards apart and plot *A*, the position of *AA1's* anchor bearing 90° and 100 yards from *AA1's* foremast. Plot *B*, the position of *AA2's* anchor, with *AA1's* anchor bearing 200°, distance 1000 yards of the scale as shown. Now plot *D*, *AA2's* present position, with *AA1* (foremast) bearing 42° and distant 810 yards. From this point draw *AA2's* course, 0°. In order to head for her anchorage it will be necessary for *AA2* to make a turn, and, as the most convenient turn to plot is one of 90°, assume a turn of 90° with standard half rudder. Through *B* draw a perpendicular to *AA2's* present course, intersecting it at *P*. This will be *AA2's* course direct to her anchorage. To find the point where the rudder must be put over, lay off from *P* on *AA2's* course a distance equal to *AA2's* advance, 765 yards. To obtain the point where *AA2* will arrive on course to head for her anchorage, lay off on *PB* a distance equal to *AA2's* transfer, 515 yards. To obtain the position of *AA2's* bridge when her anchor should be let go: on *PB* lay off *BC*, 60 yards from *B*.

The problem is now complete and the data obtained are as follows: *AA2* continuing on course 0° puts her rudder over when *AA1* bears 109°, distance 565 yards; steadies on course 90° and heads for her anchorage; lets go her anchor when *AA1* bears 202°, distance 1020 yards, and veers to 45 fathoms. *AA2* checks her approach by noting that when the stadimeter reads 940 yards, *AA1* should bear 180°; at 950 yards *AA1* should bear 186°.




PROBLEM 1.—Anchoring on Prescribed Bearing.

## PROBLEM 2.

A ship standing toward an anchorage where there is considerable current desires to anchor in a prescribed position from a ship at anchor.

### EXAMPLE.

*AA2* standing towards the flagship *AA1* is directed to anchor with *AA1* bearing 147°, distance 600 yards, 60 fathoms of chain. *AA1* signals her heading as 292°, bearing and distance of her anchor as 292°, 150 yards. *AA2* is now steering 347° and *AA1* bears 332° and is distant 1200 yards. However, as *AA2* stands on, checking up her bearing and distance from *AA1*, she notes that at 1000 yards *AA1* bears 328° instead of 329°, and at 900 yards *AA1* bears 325° instead of 327°. *Required:* The data necessary for *AA2* to carry out her orders.

### SOLUTION.

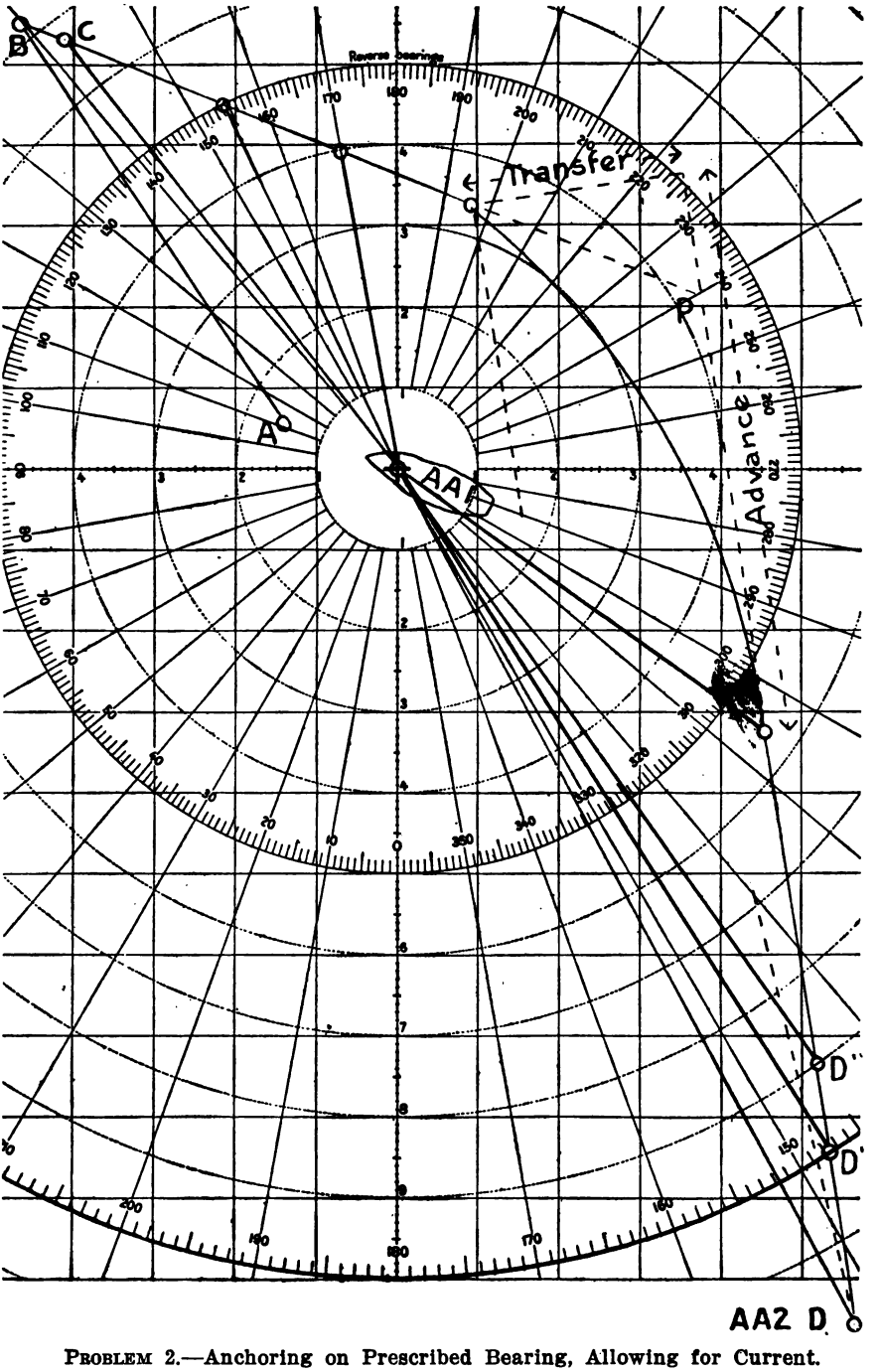
Plot *A*, the position of *AA1's* anchor on bearing 292°, 150 yards from center; then *B*, *AA2's* anchor, with *AA1's* anchor bearing 147°, distance 600 yards. Plot *D*, *AA2's* present position, and lay off his actual course through the points *D*, *D'* and *D"*, obtained from the observations of the bearing of *AA1* at 1000 and 900 yards. From a consideration of this course it is apparent that *AA2* is being set to the southward and eastward about 5°; *AA2* therefore continues on his compass course of 347°, but actually makes good a course of 352°. Since *AA1* has signalled that she is heading 292°, *AA2* decides that the current is setting approximately eastsoutheast and that she must approach her anchorage on course 292° in order to anchor heading into the current. Laying off a line 292° from *B* and obtaining the point *P* it is noted that a 60° turn will have to be made. The data for this turn, taken from the turning curve with standard half rudder are: advance, 705 yards; transfer, 260 yards.

The point where *AA2* puts over her rudder is then obtained as follows:

Draw a line parallel to the ship's course at a perpendicular distance equal to the transfer for a 60° turn. The intersection of this line with the final course to the anchorage will be the point at which the turn must be completed. From this point drop a perpendicular on the line *DP* produced. Then measure off from the foot of this perpendicular a distance equal to the advance. This will give the point at which the rudder must be put over to complete the turn at the required spot. The point of letting go, *C*, is obtained by laying off on *BP* the distance from the bridge to the hawse-pipe (60 yards).

The required data are therefore as follows:

Give the command "left standard half-rudder" when *AA1* bears 306° and is distant 560 yards; let go anchor when *AA1* bears 143° and is distant 675 yards. The accuracy of *AA2's* approach can be checked by observing bearings at 400 and 500 yards from *AA1;* they should be 170° and 155°, respectively.




PROBLEM 2.—Anchoring on Prescribed Bearing, Allowing for Current.

## PROBLEM 3.

A ship standing towards an anchorage desires to moor in a prescribed position from another ship already moored.

### EXAMPLE.

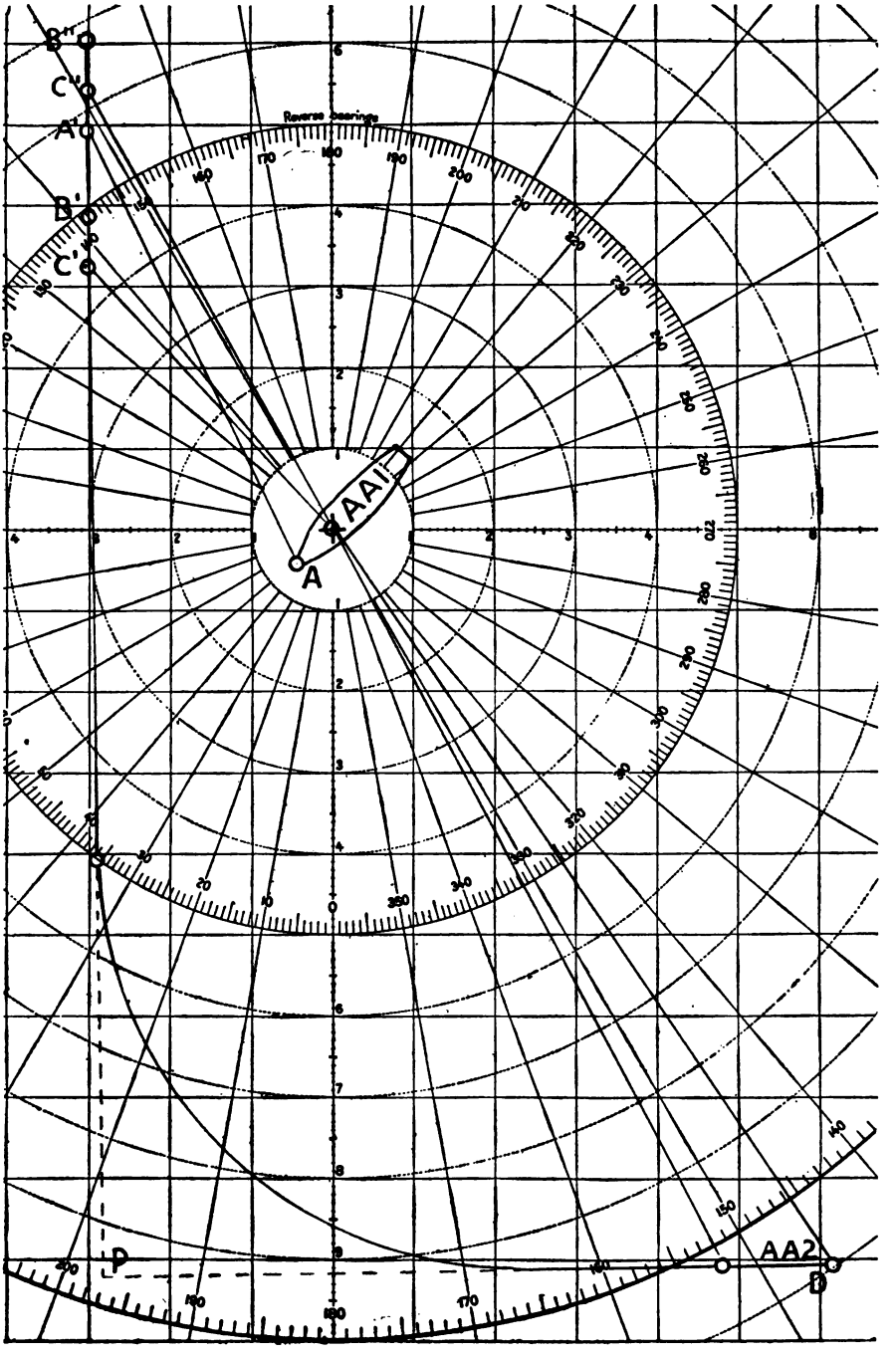
*AA2* standing towards the flagship *AA1* is directed to moor with 60 fathoms on each chain with flagship bearing 155°, distance 600 yards, line of anchors 0°-180°. *AA1* signals her heading as 225°. *AA1* bears 326° and is distant 1100 yards. *Required:* The data necessary for *AA2* to carry out her orders.

### SOLUTION.

Since *AA1* did not signal to the contrary, assume that *AA1's* stem is at the center of her span and after placing *AA1's* foremast in the center of the board plot *A*, the position of *AA1's* stem, 60 yards, 225°, from the center. Now plot the point *A'*, the center of *AA2's* span, 600 yards, 335°, from *A*. Through this point draw the line of her anchors (0°-180°). Ten fathoms are usually allowed for the distance from the stem to where the mooring swivel is put on inboard, depth of water, rise and fall of tide, etc. The distance that must be laid off from *A'* on the line of anchors must equal one-half the sum of the lengths ordered for each chain minus 10 fathoms allowed for slackness of moor. In this case the distance will be $\frac{1}{2}(60+60-10)$ fathoms = 55 fathoms = 110 yards. Plot the positions of each of *AA2's* anchors at *B'* and *B''*, 110 yards from *A'*. In approaching the anchorage *AA2* decides on a flying moor, during which she must be on course 0° in order to lay out her anchors correctly. She will therefore steer 270° to the point where she must put her rudder over for a 90° turn, arrive on the 0° course as shown, and have about 740 yards in which to straighten out and check her position. She will let go the first anchor when her bridge is at *C'*, and her second anchor when at *C''*.

The following data are obtained:

From initial position *D*, course 270° until *AA1* bears 333°, distance 1040 yards, then course 0°. Let go first anchor when *AA1* bears 138°, distance 445 yards. Let go second anchor when *AA1* bears 152°, distance 620 yards.




PROBLEM 3.—Mooring on Prescribed Bearing.

## PROBLEM 4.

A ship standing towards an anchorage desires to approach the anchorage and moor on a prescribed bearing from another ship already moored, but riding to open hawse.

### EXAMPLE.

*AA2* standing towards the flagship *AA1* is directed to moor with 75 fathoms on each chain with flagship bearing 300°, distance 500 yards, line of anchors 0°-180°. *AA1* signals her heading as 83° and that her stem is 25 yards to leeward of her line of anchors. *AA1* now bears 41° and is distant 780 yards. *Required:* The data necessary for *AA2* to carry out her orders.

### SOLUTION.

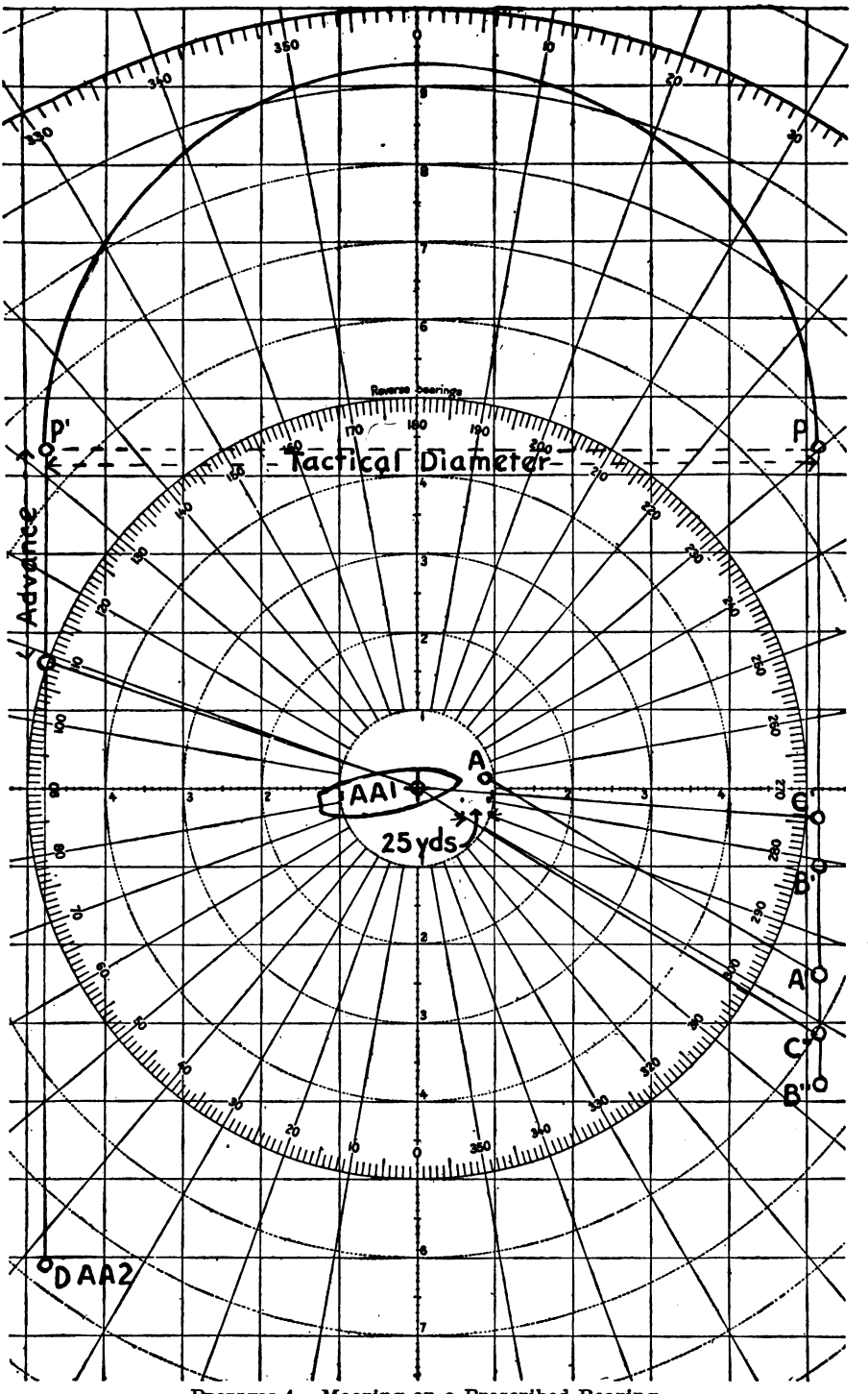
Plot *AA1's* foremast in the center of the board, then plot *A*, the center of her span, on bearing 83° and at a distance of 60 yards + 25 yards from the center of the circles. The center of *AA2's* span, *A'*, is then plotted bearing 120°, distant 500 yards from *A*. Lay off on either side of *A'* a distance equal to $\frac{1}{2}(75+75-10)$ fathoms $=140$ yards and obtain the points *B'* and *B''* as before. *AA2* must make a flying moor, therefore her course must coincide with the line of anchors. She decides to make a turn of 180° and wishes to allow 500 yards for straightening out and adjusting her course after the turn. The advance for a turn of 180° is 275 yards, tactical diameter 1000 yards. The method of plotting is as shown in the figure.

The following data are obtained:

From initial position course 0° until *AA1* bears 109½°, distance 500 yards, then put rudder over.

Let go first anchor when *AA1* bears 274½°, distance 520 yards.

Let go second anchor when *AA1* bears 302°, distance 600 yards.




PROBLEM 4.—Mooring on a Prescribed Bearing.

## MANEUVERING PROBLEMS.

By LIEUT. COMMANDER W. C. I. STILES, U. S. Navy.

While the previous problems have been concerned with directing a ship to a fixed position, the object of maneuvering problems is to take a certain position with reference to a ship which is under way. In these problems a careful distinction must be drawn between the actual track of the ship through the water and her *relative* movement with reference to the ship on which the maneuver is based.

Suppose that two ships are under way, as shown in Fig. 1, steaming on the same course at equal speeds. In this case there will be no change in their relative position, though both are changing their absolute positions. The motion of ship *B* in the direction of *BB'* has been counteracted by the motion of *A* in the same direction, and therefore the relative motion of ship *B* to *A* is zero. If we should wish to show this graphically we would choose a suitable scale for speed and lay down *OD* (Fig. 2) in the direction of the course and equal to *B's* speed, then from the point *D* we would lay down the same distance *DO, but with A's course reversed.* This would bring us back to the starting point, *O*, and would show that with reference to point *O* there was no change and that the relative motion of the two ships was zero.

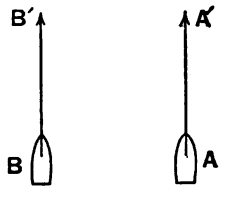


FIG. 1.

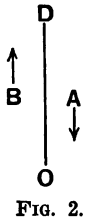


FIG. 2.

Now suppose that *A* is steaming on course 0° at a certain speed and that *B* is steaming on course 20° at a slightly faster speed, so that she constantly remains on *A's* port beam. In this case *B's* motion to the front is counteracted by *A's* motion to the front, but *B's* motion to the side is not counteracted, and if the vessels continued at these courses and speeds, a collision would be bound to occur. From the figure it is easily seen that for the courses and speeds as shown, the motion of *B* in the direction of *A* is represented by *BC*. Now suppose we wish to show graphically the relative motion of the two ships with respect to the initial positions. In this case we would lay down *BB'* in the direction of *B's* course and equal to her speed, and from the point *B'* we would lay down *B'C* equal to *A's* speed and in the *direction of A's course reversed.* By connecting the points *B* and *C* we then obtain the relative direction of motion of the two ships to the scale of the speeds.

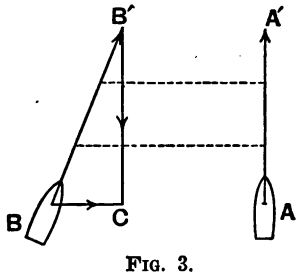


FIG. 3.

The same construction will show the relative change of position of any two ships under way on constant courses and speeds. Suppose the ship *A* (Fig. 4) is steaming on course 0° at a speed represented by *AA'* and that the ship *B* is steaming on course 60° at a speed represented by *BB'*. From *B'* draw *B'C* equal to *A's* speed and in the direction of *A's* course reversed, and

connect the points $B$ and $C$. The line $BC$ represents, in direction and to the scale of the speeds, the relative motion of ship $B$ to ship $A$ referred to the initial position of $A$. To an observer on ship $A$ steaming along $AA'$, ship $B$ would appear to run along the line $BC$. This observer would see ship $B$ forward of $A's$ port beam and would see her drop back to the beam and then to the quarter, passing astern of $A$ at the distance $AD$, and finally opening out on the starboard quarter. The movement would appear to this observer to be exactly the same as if ship $A$ remained stationary and ship $B$ steamed along the course $BC$ at the speed $BC$.

The triangle $BB'C$ is called the speed triangle. In work on the mooring board it is usually modified, however, as follows:—From the center of the board the course and speed of ship $A$ is laid off as shown at $OA$ (Fig. 5). From the same center the course and speed of ship $B$ is laid off at $OB$. The relative motion of the two ships, $AB$, is found by connecting the two points $A$ and $B$. The same construction is used to determine the course which a ship

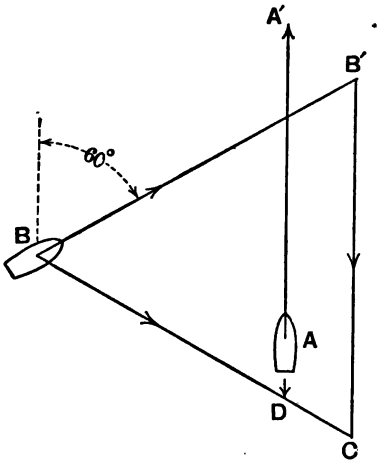



FIG. 4.

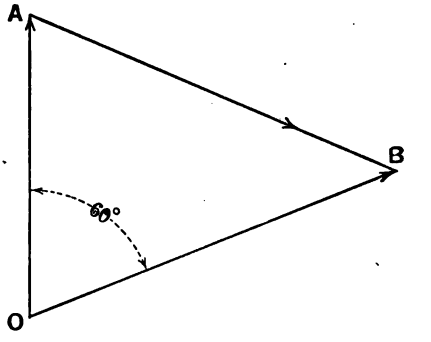



FIG. 5.

must steer to produce a certain change of position. In this case $OA$ is laid off to represent the course and speed of the guide, $AB$ is drawn in the line of the relative movement desired and $OB$ is made equal in length to the speed of the maneuvering ship. The direction of $OB$ will then represent the course which the maneuvering vessel must take to secure the desired relative change of position.

In the solution of these problems two separate scales must be used, one for speeds and the other for distances. Usually it is most convenient to assume that the distance between circles represents two knots. The scale selected for distances should be the largest that will allow the problem to be plotted within the limits of the board. It is of greatest importance to bear in mind constantly which lines represent speeds and which represent distances and to avoid confusing the two systems.

In practice there will often not be time to work these problems out before it becomes necessary to direct the ship towards her new position. In such cases the ship should be set approximately on her new course by eye, and the course corrected by the mooring board as promptly as possible.

## PROBLEM 5.

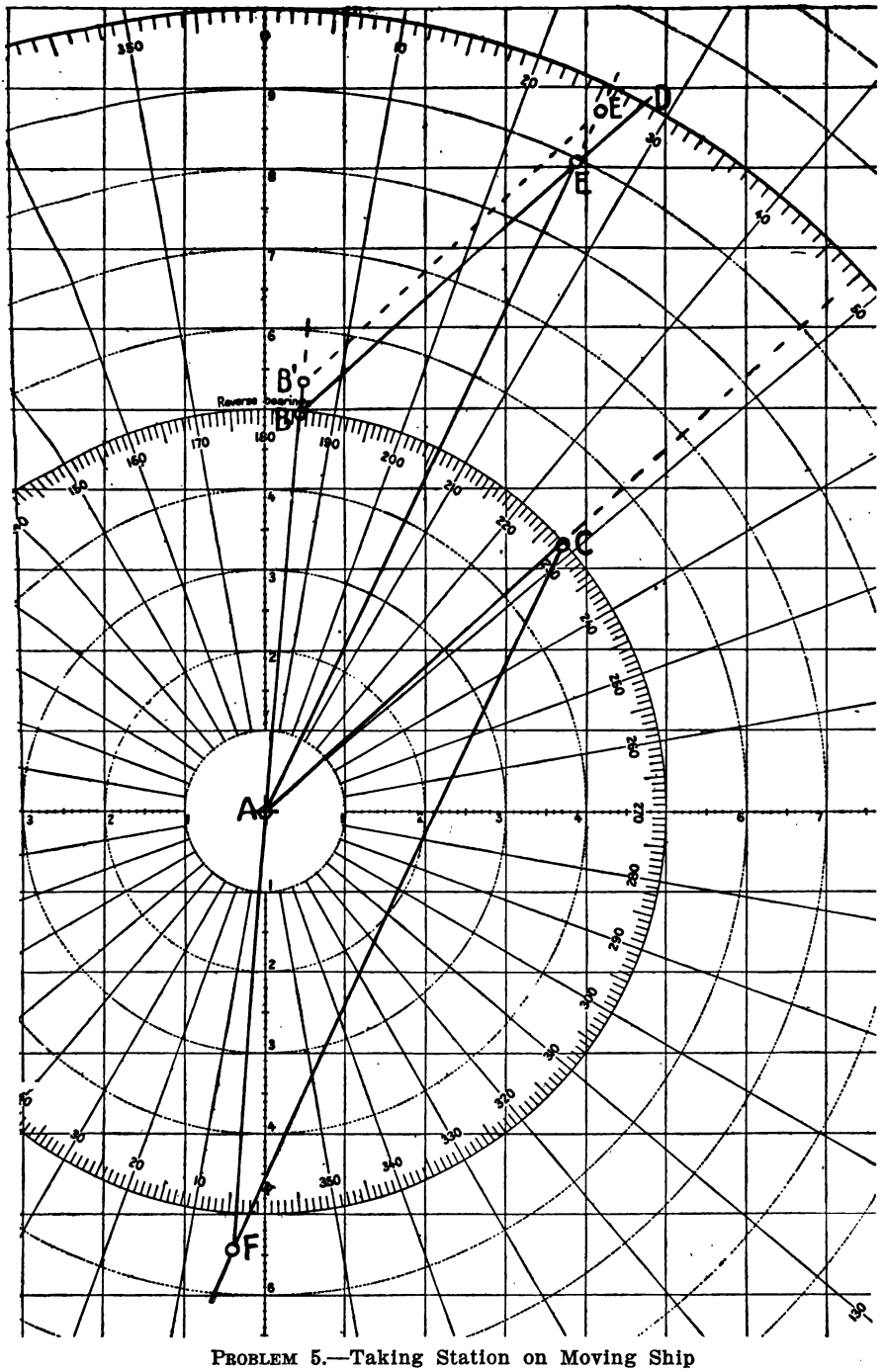
Taking station on a given bearing and distance from a moving ship, using a given speed.

The fleet is steaming on course 5° at 10 knots, a destroyer is called within hail of the flagship and ordered to take a position bearing 48° from flagship at a distance of five miles. The destroyer has steam for 18 knots. Find the direct course to station and the time necessary to get in position.

### SOLUTION.

Plot flagship's position *A* at the center of the board. Lay off *AB* in the direction of her course, point *B* being at a distance proportional to her speed (taking as the *speed scale,* distance between circles equals two knots). Plot *C* the position relative to the flagship which the destroyer is directed to assume (taking as *distance scale,* space between circles equals one mile). This will be on bearing 48° on the fifth circle. *AC* will therefore be the destroyer's track, *relative to the flagship.* If we stand on the flagship the destroyer will appear to gradually open out on this bearing until she has reached her station. In a certain space of time the flagship will have reached point *B.* The destroyer will then bear from point *B* in the direction of *AC;* therefore, if we draw a line *BD* through *B* parallel to *AC,* the destroyer must be somewhere on this line. But the destroyer, having steamed at 18 knots from *A,* must at this instant be somewhere on the 18-knot circle. Therefore, the position of the destroyer is marked by point *E,* the intersection of *BD* with the 18-knot circle, and *AE* gives the course the destroyer must steer to reach her position, 26°. The triangle *ABE* may be called the "speed triangle," as it will be seen that its size depends entirely upon the scale to which the speeds are plotted.

In the interval of time which it has taken the flagship to cover the distance *AB,* the destroyer has increased her distance from the flagship by the amount *BE.* By extending *AB* and *AE,* placing the parallel rulers on *BE* and running out until *B'E'*, the distance intercepted between the lines, is equal to *AC;* the distance required to complete the maneuver can be determined. In many cases this will run off the board, so the same result is obtained by constructing on *AC* a triangle similar to *ABE.* This is done by drawing *CF* parallel to *AE* and producing *BA* to intercept it at *F.* Triangle *FAC* may be called the "distance triangle" as it shows the tracks of the vessels drawn to the *distance scale. FC* will then be the distance run by destroyer, while *FA* is the distance run by the flagship in the same time. The destroyer's distance, *FC,* is measured and found to be 9.8 miles, which at 18 knots will require 32 minutes and 40 seconds.




PROBLEM 5.—Taking Station on Moving Ship

## PROBLEM 6.

Changing station with reference to a moving ship using a given speed.

The fleet is steaming on course 342° at 10 knots. A destroyer which has the flagship bearing 88°, distance 8000 yards, is directed to take a position bearing 335° from the flagship, distance 10,000 yards. Find the course which the destroyer must steer to reach her assigned position using 18 knots speed, and the distance to be steamed.

### SOLUTION.

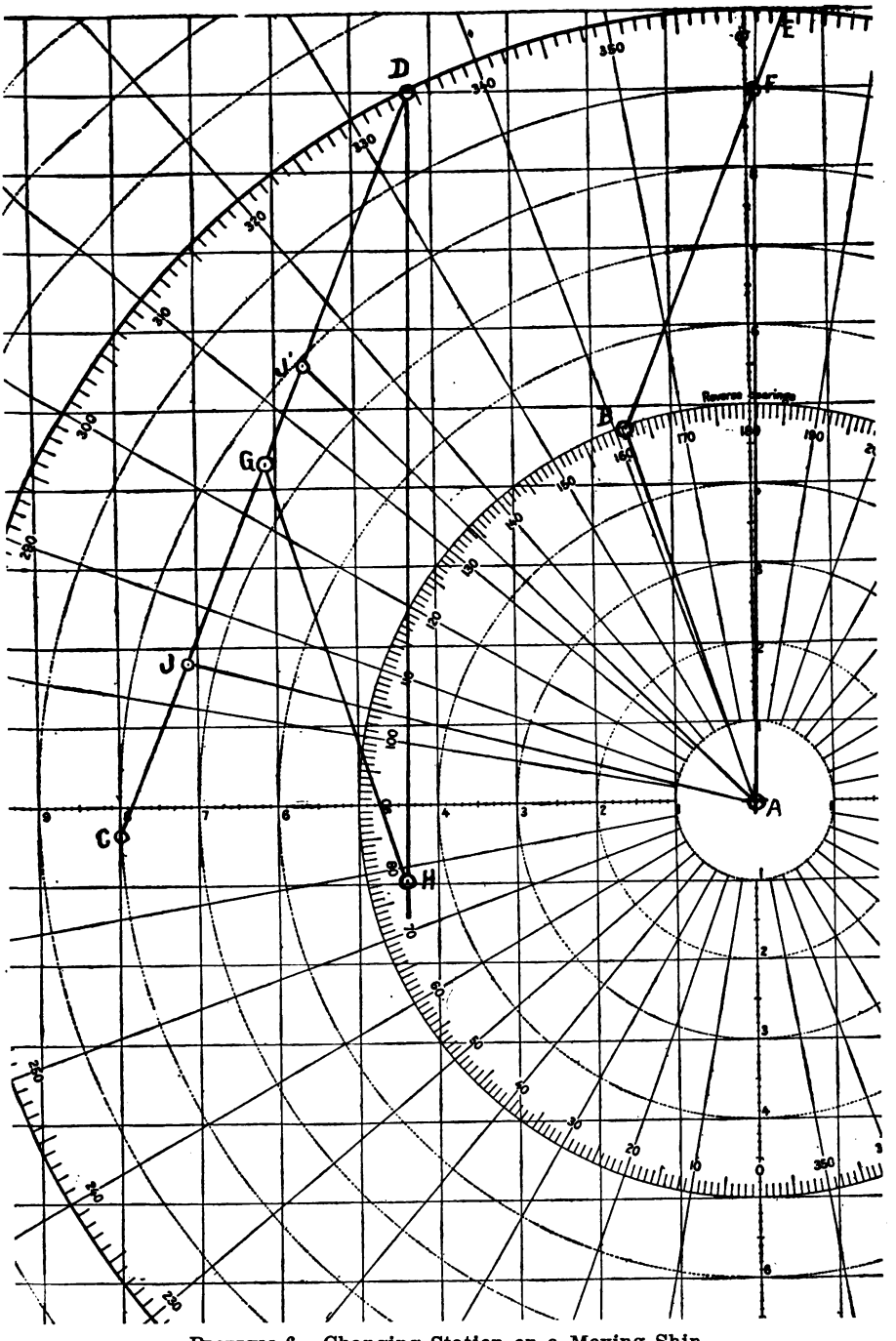
From the center plot the flagship's course and speed *AB*. Plot the present position of the destroyer at *C* and the relative position she is directed to assume at *D*, considering the distance between circles as 1000 yards. Connect *C* and *D*, and through *B* draw *BE* parallel to *CD*. The line *BE* intersects the 18-knot speed circle at *F*. *AF*, the course which the destroyer must take, is 1°, and the triangle *ABF* is the speed triangle. Since by construction *AB* represents the flagship's course and speed, *BF* the relative motion of the destroyer to the flagship, and *AF* the destroyer's speed, the direction of *AF* must show the destroyer's course.

Having established the speed triangle, to find the distance to be run it is necessary to expand this triangle to an enlarged scale, so that the relative motion, *BF*, will be equal to *CD*. This is best done by constructing on *CD* a triangle similar to *ABF*. It is at once seen that such a triangle would extend beyond the limits of the board. The result is therefore secured by bisecting *CD* at *G*, and thus constructing the triangle to half-scale by drawing *GH* parallel to *AB*, and *DH* parallel to *AF*. *HD* measured to this new scale (one division equals 2000 yards) will give the distance to be steamed by the destroyer, which is 20,000 yards. It is interesting to note that *HG* represents the distance steamed by the flagship and *GD* the relative change of position, all being measured, of course, to the reduced scale.

*CD* represents the motion of the destroyer relative to the initial position of the flagship at point *A*. This motion is the same as though the flagship were stationary and the destroyer actually steamed along the line *CD* at a speed represented by *BF*, in this case 9.1 knots. Frequent checks should be made by plotting the bearing and distance of the destroyer from the flagship. These plots should all fall on the line *CD*. Thus by plotting the points *J* and *J'* it is found that when the flagship's bearing is 105° her distance should be 7350 yards, and when she bears 135° her distance should be 7950 yards. The plots show immediately the position of the destroyer relative to the line. If off the line, the course may be altered 5° or 10° to the right or left until the plots again fall on the line *CD*.

The construction of the speed triangle in the foregoing case is the foundation of all maneuvering problems and may be summarized by the following rule:

**Lay off from the center a line representing the course and speed of the guide. From the extremity of this line draw a second line, parallel to a line connecting the present position with the relative position to be attained. The intersection of this line with any speed circle will show the course which must be steered to reach the desired station at that particular speed.**




PROBLEM 6.—Changing Station on a Moving Ship.

## PROBLEM 7.

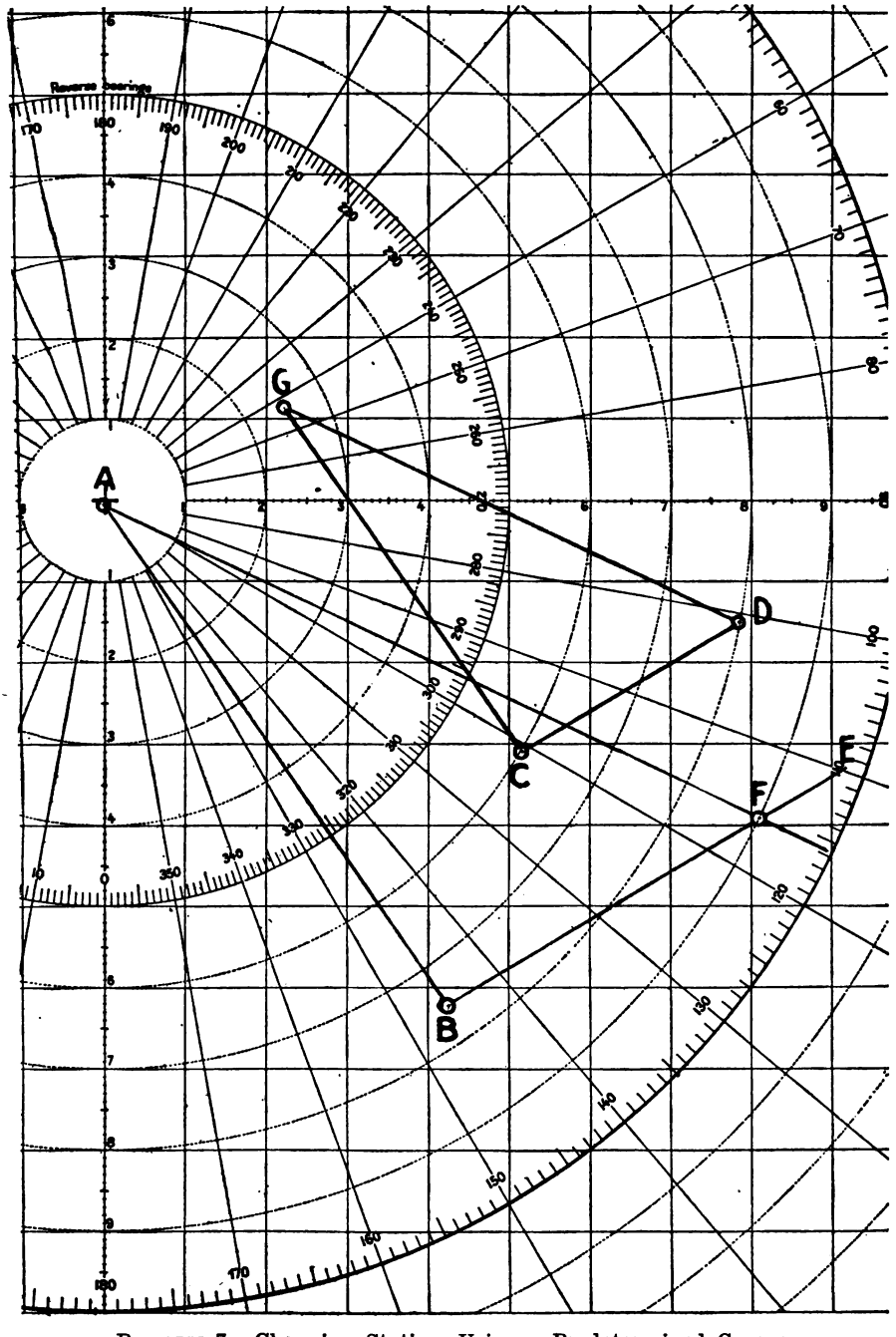
Changing station on a moving ship using a predetermined course.

The fleet is steaming on course 145° at 15 knots. A cruiser *C* bearing 120°, distant 6000 yards from the flagship, is ordered to take distance 8000 yards on bearing 100°, position *D*. Her captain decides to steer 115° to reach his new station. What speed should he use and how long will it take to complete the maneuver?

### SOLUTION.

Plot *AB* equal to the flagship's course and speed. Plot *C*, the present position, and *D* the position to be reached. Draw *BE* parallel to *CD* and intersect it with *AF*, drawn in the direction which it is decided to steer. The length *AF* is equal to the speed that the cruiser must take, 18 knots. It will be noted that the method of solution is identical with that of the previous problem, except that here we assume a course and find the corresponding speed by means of the line *BE*, instead of assuming a speed and finding the corresponding course.

To find the distance to be steamed, the distance triangle *CDG* is drawn similar to the speed triangle *ABF*, making *CG* parallel to *BA* and *DG* parallel to *FA*. *DG*, the distance to be steamed, is 6250 yards, or 10½ minutes steaming at 18 knots.




PROBLEM 7.—Changing Station, Using a Predetermined Course.

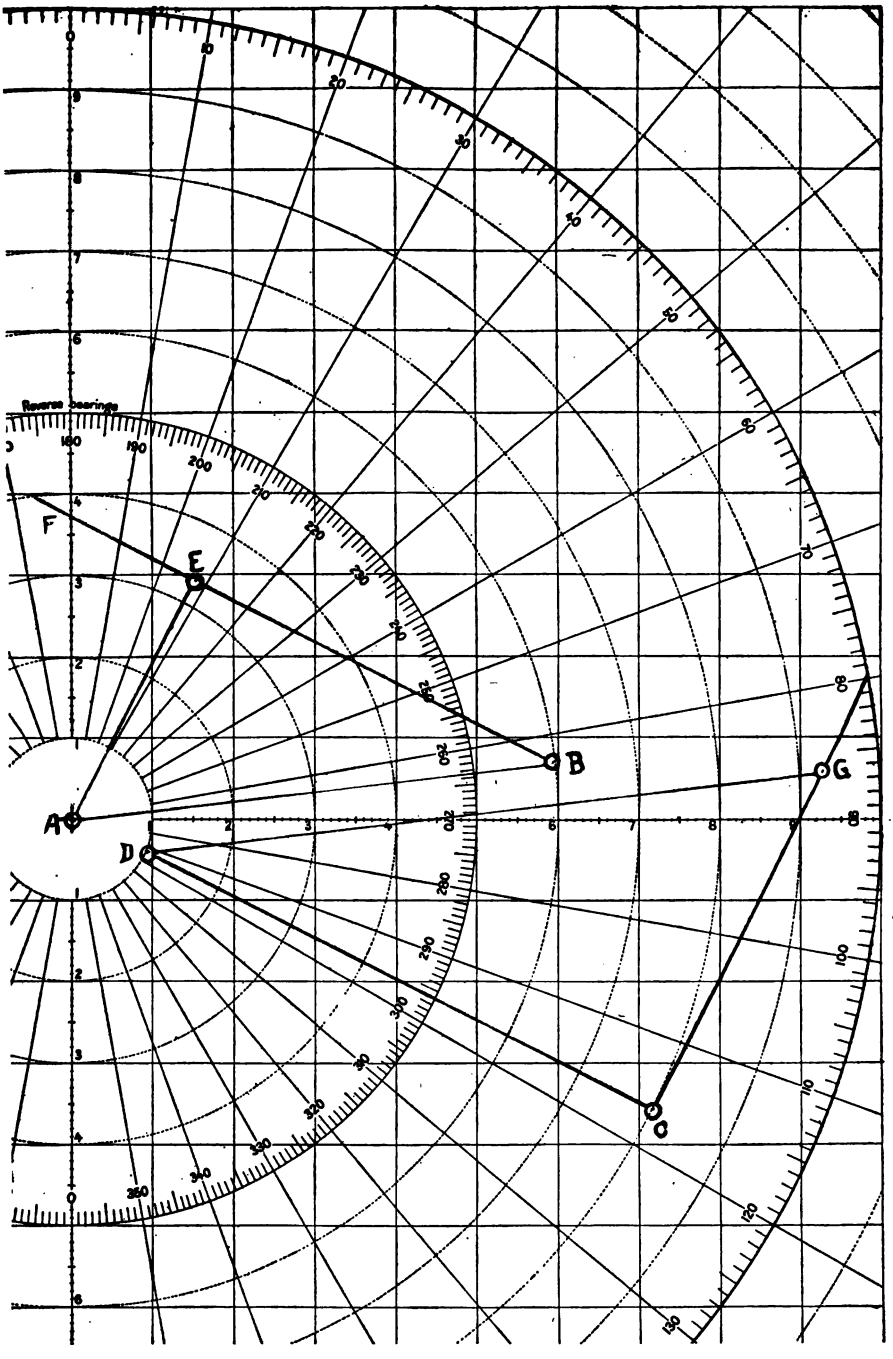
## PROBLEM 8.

To find the minimum speed and corresponding course necessary to reach a certain station and the time required.

A submarine observes an enemy ship bearing 295° and distant 8000 yards. The ship's course is estimated at 82° and her speed as 12 knots. It is desired to run submerged to a position for attack 30° on her starboard bow at 1000 yards distance and to economize on the use of storage batteries by running at the lowest possible speed. What course and speed should the submarine take?

### SOLUTION.

As in previous problems, plot $AB$ from the center equal to the enemy's course and speed. Plot points $C$ and $D$ representing respectively the present position of the submarine and the relative position to be attained. Through $B$ draw a line $BF$ parallel to $CD$. Then if any point on this line be selected, the distance of this point from $A$ will represent a speed which could be used to attain the new position, while its bearing from $A$ will represent the corresponding course. Obviously the point to be selected in this case will be the point where this line passes closest to $A$. Since the perpendicular distance is less than any oblique distance, drop a perpendicular from this line on $A$ and the distance $AE$ will give the minimum speed, 6⅔ knots, while the course to be steered is in the direction $AE$, or 26°. Constructing the distance triangle $CDG$ as before, similar to the speed triangle $ABE$, the distance to be run, $CG$, is found to be 4650 yards, which at 6⅔ knots will require nearly 21 minutes.




PROBLEM 8.—Finding Minimum Speed to Reach Station.

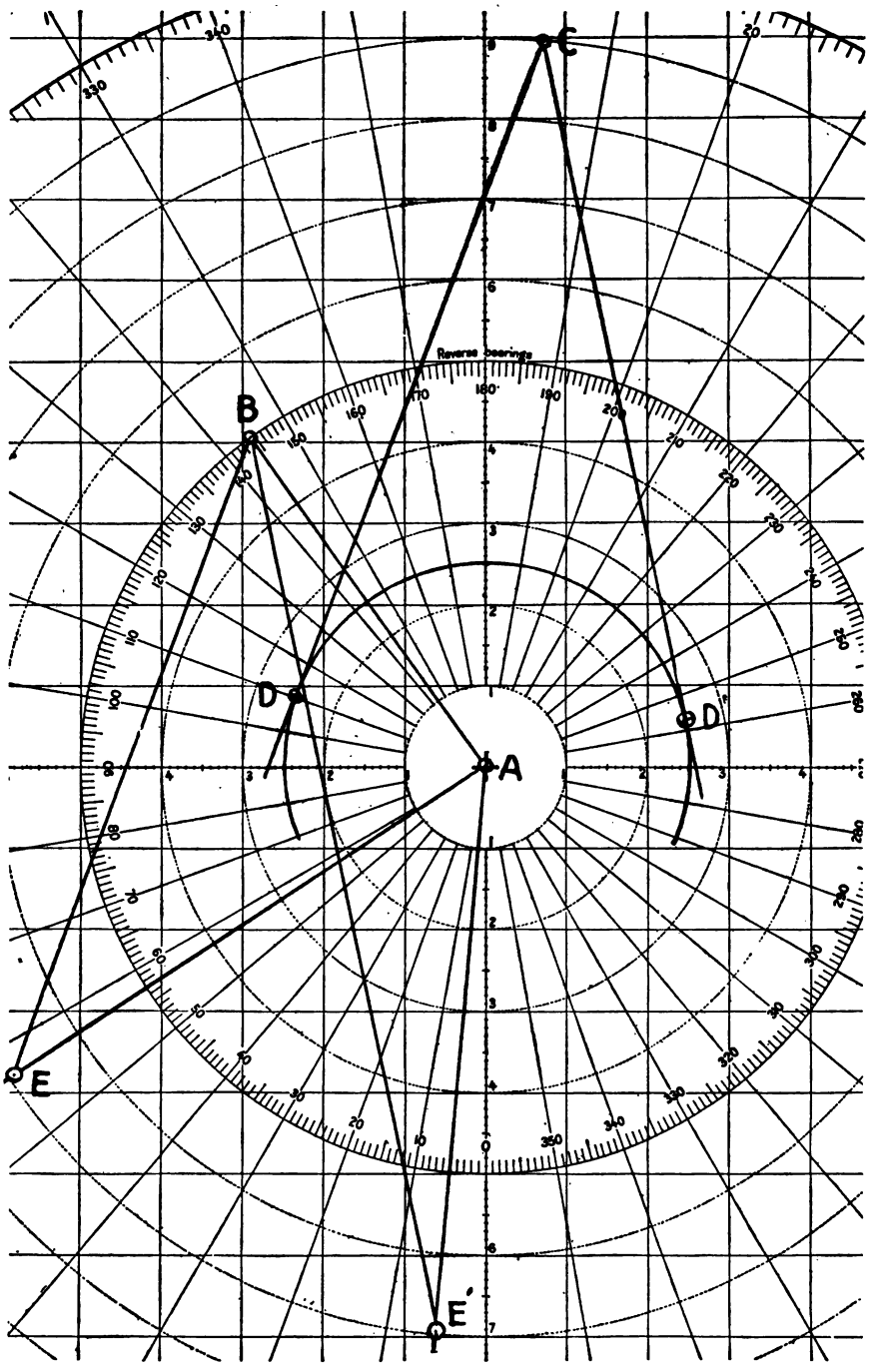
## PROBLEM 9.

To pass outside of a certain range from a ship whose course and speed are constant.

A scout steaming on course 203° at 14 knots observes an enemy ship bearing 183° and distant 18 miles. The enemy is proceeding on course 323° at 10 knots. The conditions are such that it is not considered that the enemy will try to intercept the scout. Find the best course to be steered to pass at a minimum distance of five miles from the enemy.

### SOLUTION.

Plot $AB$ representing the course and speed of the enemy ship. Plot $C$, the present position of the scout. Then if we draw a circle about $A$ with a radius of five miles, the scout must never take a relative position inside of this circle. From $C$ draw two tangents to the five-mile circle $CD$ and $CD'$. The points $D$ and $D'$ will then represent two relative positions to be arrived at which conform to the conditions of the problem. If we select $D$ we will cross the bow of the enemy and if $D'$ we will pass across her stern. Solving these two problems by the method given in Problem 6, we obtain the two courses $AE$ and $AE'$, which are 235° and 183° 30′, respectively. Since the latter is nearest to the direction of the scout's original course it offers the best solution.




PROBLEM 9.—To Pass Outside a Certain Range.

## PROBLEM 10.

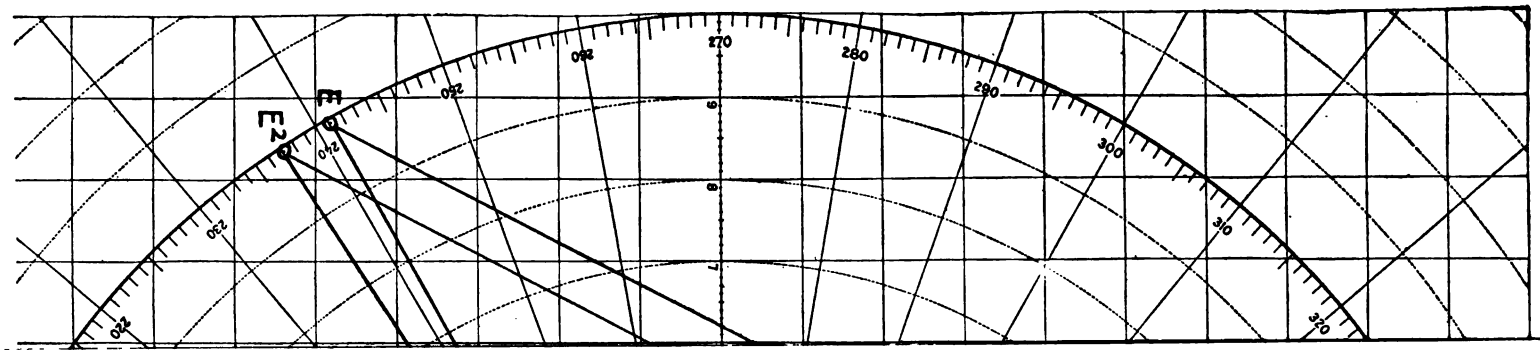
To pass outside a certain distance from a ship which is endeavoring to intercept.

A scout observes an enemy bearing 192°, distance 18 miles. The scout's speed is 20 knots and the enemy's estimated speed, 11 knots. Find the best course which will permit the scout to steam to the southward without passing within five miles of the enemy.

### SOLUTION.

This problem is the same as Problem 9, except that it is assumed that the enemy will attempt to intercept. Plot the enemy's position at $A$ and that of the scout at $C$. If we draw a circle about $A$ at a distance representing the enemy's speed, then any radius, such as $AB$, represents a possible movement on the part of the enemy. Draw the circle $DD'$ with a radius of five miles and construct the tangents $CD$ and $CD'$ as in Problem 9. To complete the problem it is necessary to draw lines parallel to these tangents from some point on $A's$ speed circle. If these lines are drawn tangent to this circle through points $F$ and $F'$ then we have allowed for the most favorable course which the enemy may steer to intercept. Extending these lines to cut the scout's speed circle at $E$ and $E'$, the courses $AE$ and $AE'$ will be the limits beyond which it will be impossible for the enemy to approach to within five miles of the scout. It will be seen that if the enemy should take any other course than $AF$ or $AF'$ in an endeavor to intercept, such as $AB$, then the course to avoid him would be $AE_2$ and it would not be necessary to make such a detour. $AF$ and $AF'$ then represent the most dangerous courses which the enemy may take. Since these lines pass through points $D$ and $D'$ it is seen that it is unnecessary to construct the enemy's speed circle $BFF'$, as the same result may be secured by extending $AD$ and $AD'$ to a distance proportional to the enemy's speed. It may also be noted that the figure is symmetrical to the axis $CA$ and that it is therefore not strictly necessary to plot both points $E$ and $E'$.

The scout can therefore steam on course 142° 30′ or on course 241° 30′ with the assurance that the enemy cannot approach closer than five miles. As it is desired to make good as much distance to the southward as possible, 142° 30′ offers the best solution.


E2
F1
270
280
290
300
310
320
240
230

## PROBLEM 11.

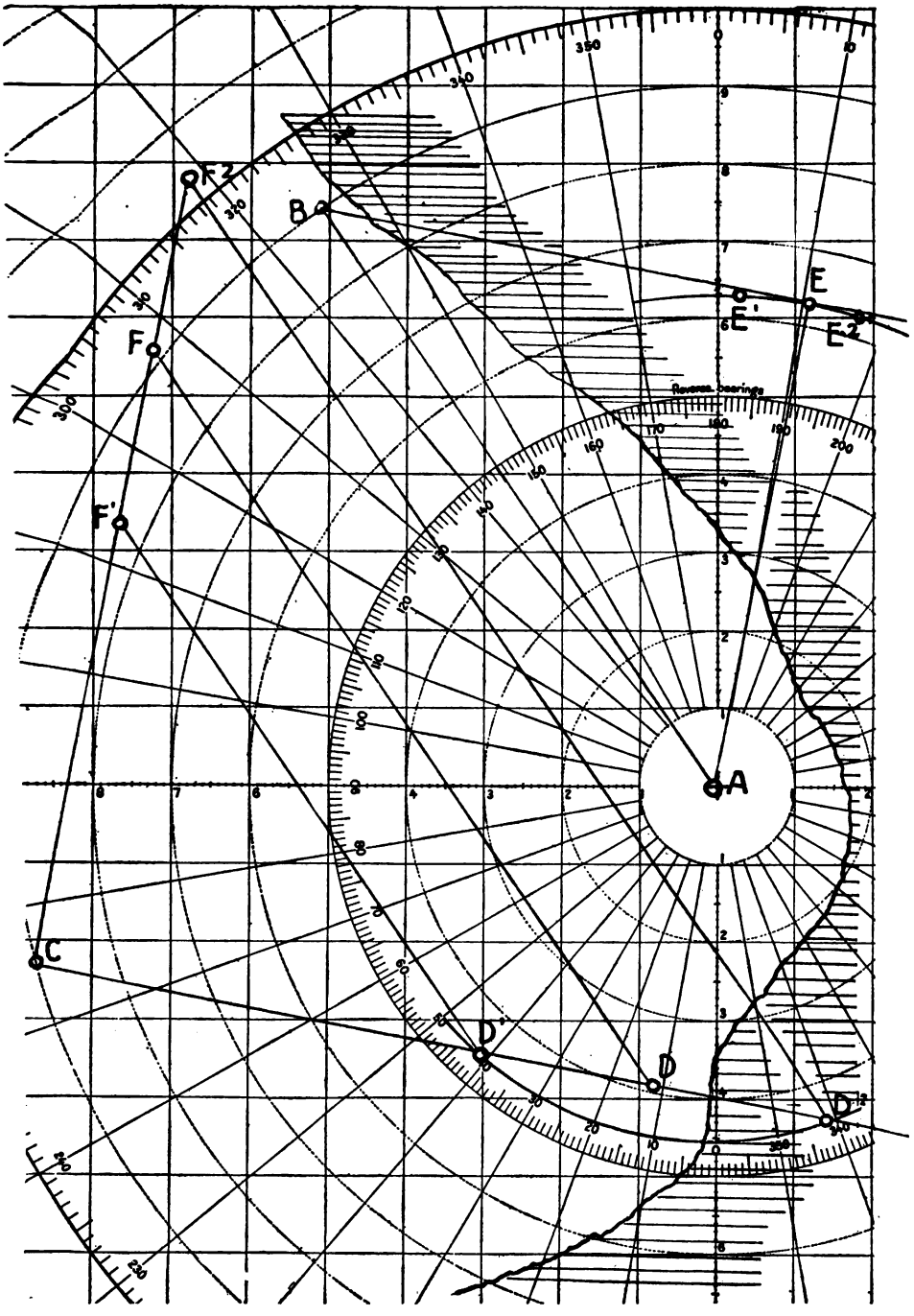
To attain the minimum range on a faster ship whose line of retreat is limited.

A cruiser, speed 19 knots, sights an enemy torpedo-boat, speed 27 knots, bearing 75°, distance 18,000 yards. The torpedo-boat's line of escape is limited by adjacent land to course 325°. The effective range of the cruiser's guns is 9000 yards. Find the minimum range which can be reached and the time that the destroyer will be under fire.

### SOLUTION.

Lay off the torpedo-boat's course and speed $AB$ (using three knots equals one division). The cruiser's course must be selected so that the line showing her relative movement, $CD$, will pass as close to $A$ as possible. If the course $AE$ is selected, such that $BE$ is tangent to the circle representing the cruiser's speed, then it is seen that the above condition is fulfilled. The line showing the cruiser's relative movement must be drawn parallel to $BE$, as shown in previous problems, and if any other point, such as $E'$ or $E^2$, were selected the result would be to throw this line $CD$ further to the southward.

Therefore, from $B$ draw a line tangent to the cruiser's speed circle, and the radius $AE$ to the point of tangency will give the course to be steered, in this case 10° 30′. Drawing $CD$ parallel to $BE$, the minimum range is found to be $AD$, 7800 yards. $CD$ represents the cruiser's track *relative* to the torpedo-boat, and the intersections $D'$ and $D^2$ with the 9000-yard circle will be the relative positions when coming into range and passing out of range respectively. Complete the distance triangle by drawing $CF$ parallel to $AE$ and $DF$ parallel to $AB$. $CF$ is the course and distance steamed by the cruiser, while $DF$ represents the course and distance of the torpedo-boat. Drawing $D'F'$ and $D^2F^2$ parallel to $AB$ gives the points $F'$ and $F^2$, the actual points of coming into and passing out of range. The distance $F'F^2$, divided by the cruiser's speed, will give the length of time the torpedo-boat is held under fire (about 14 minutes).




PROBLEM 11.—To Attain Minimum Range on a Faster Ship.

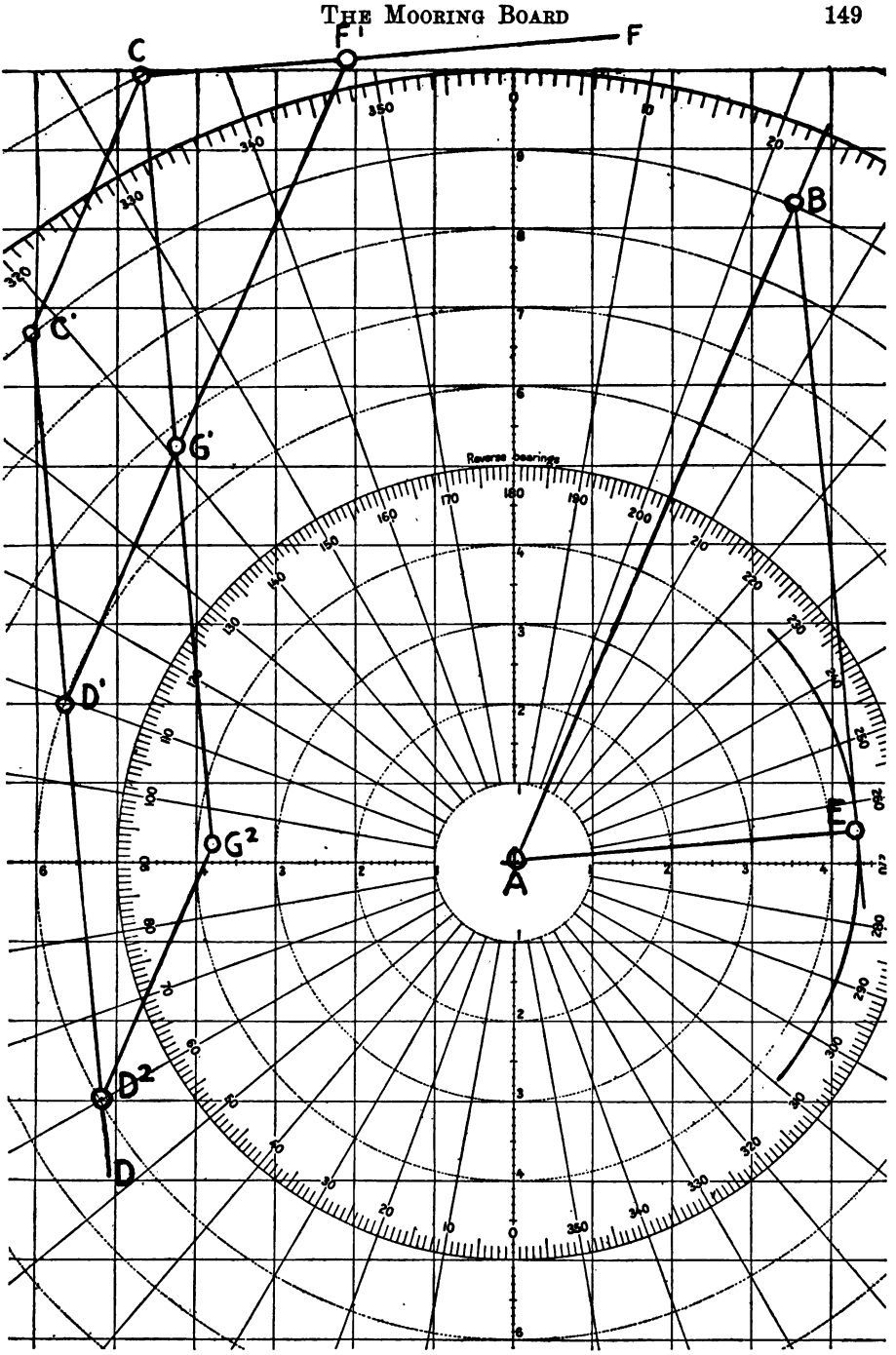
## PROBLEM 12.

To find the best course to approach for a torpedo attack.

A submarine, maximum submerged speed 8½ knots, armed with 6000-yard, 30-knot torpedoes, sights an enemy transport guarded by destroyers bearing 154°, distance 11,000 yards. The transport's estimated course is 23°, speed 18 knots. What should be the course to reach a position for attack?

### SOLUTION.

Since a 30-knot torpedo will run 6000 yards in six minutes, the point for which a torpedo is directed for a shot at maximum range is a position ahead of the ship by the distance she would travel in six minutes, or 3600 yards. Lay off the transport's course and speed $AB$. Plot $C$ the position of the submarine with reference to the transport. From $C$ lay off along the transport's course, reversed, 3600 yards to point $C'$, which will represent the submarine's position with reference to the point of aim. The problem is now similar to Problem 11. From $B$ draw a tangent $BE$ to the submarine's speed circle. The course to be steered is thus found to be $AE$ (85°). $C'D$ the relative line of approach to the point of aim is drawn parallel to $BE$, giving the points $D'$ and $D^2$ of coming into range and passing out of range, respectively. It will be noted that $C'D$ gives the relative line of approach with regard to the point of aim and not to the transport herself. This last may, however, be readily found by drawing $CG^2$ parallel to $BE$ and intersecting it with $D^2G^2$, and $D'G'$ drawn parallel to the transport's course. Measuring $AG'$ and $AG^2$, the following data are obtained: On coming into torpedo range the transport should bear 140°, distance 6750 yards. At passing out of torpedo range transport should bear 92° 30′, distance 3850 yards. To find the distance to be covered before coming into torpedo range, draw the actual track of the submarine $CF$ parallel to $AE$. Intersecting this line with $D'G'$ produced will give $F'$, the actual position of the submarine when a torpedo range of 6000 yards is obtained. $CF'$ is found by measuring to be 2600 yards, which at 8½ knots will require 9.2 minutes. The submarine, therefore, can run on course 85° for nine minutes without showing her periscope.




PROBLEM 12.—To Attain Position for Torpedo Attack.

## PROBLEM 13.

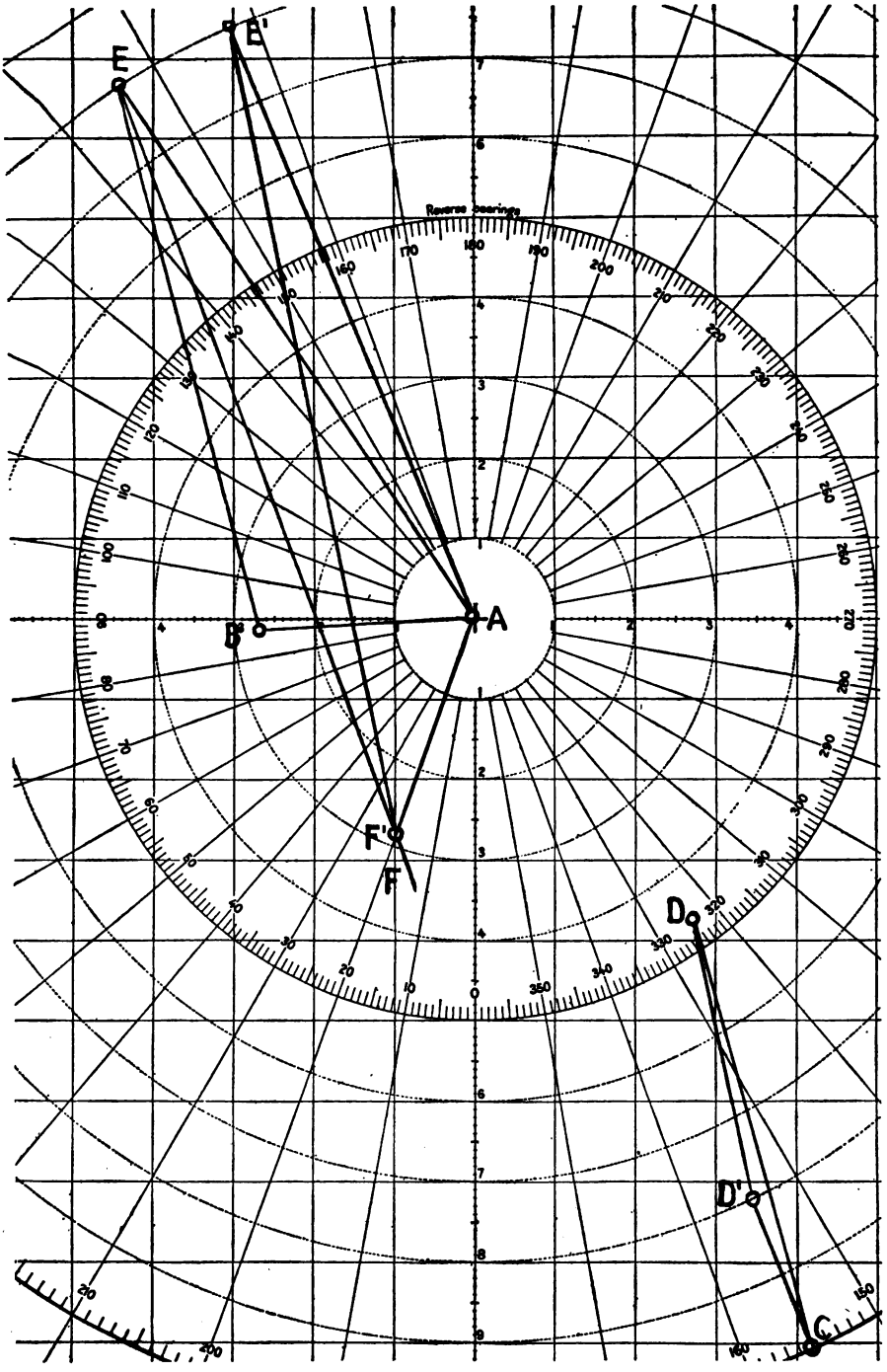
To make an approach on a target whose course and speed are unknown.

A battleship is approaching a target which bears 335°, distance 30,000 yards. The target is thought to be heading in a westerly direction at a speed between five and eight knots. The commanding officer receives orders to open fire with the target bearing 323°, distance 14,000 yards. How should the ship reach the required position using 16 knots speed?

### SOLUTION.

Using one division equals 3000 yards, the present position of the ship is plotted at $C$ and the relative position she is directed to assume at $D$. The most probable course of the target is considered 265° and the most probable speed 5¼ knots. Using these figures, the line $AB$ is plotted representing the target's course and speed. Upon these assumptions the proper course to reach the given position is found to be $AE$ (326° 30′), as explained in Problem 6. The ship is put on this course, and bearings and distances of the target are plotted. In nine minutes the range is closed to 24,000 yards, and it is noted that the bearing of the target is now 334° instead of 332° 30′ as given by the line $CD$. The new position is plotted at $D'$. Drawing a line $EF$ from $E$ parallel to $CD'$, we know that the target's actual course and speed must be represented by a line from $A$ to some point on this line. Measuring $CD'$ (6000 yards) and dividing it by the elapsed time (nine minutes) gives us 20 miles per hour as the rate of relative change of position of ship and target. Therefore, if we lay off $EF'$ equal to 20 knots of the speed scale and connect $AF'$, $AEF'$ will be the "speed triangle" and $AF'$ will represent the actual course and speed of the target, 200°, 5¾ knots.

With this information we can plot the course necessary for us to use to go from the present position $D'$ to the desired position $D$, as explained in Problem 6. Drawing $F'E'$ parallel to $D'D$, intersecting the 16-knot circle at $E'$, we get $AE'$ for our new course, or 337° 30′. As the range-finder readings may be considerably in error at extreme ranges and the target may change course at any time, we must continue to plot bearings and distances. If these plots fall on the line $D'D$ we are assured that our course is correct, but if they incline to one side or the other we must proceed to a new determination of the actual course and speed of the target as before.




PROBLEM 13.—Approaching a Target Whose Course and Speed are Unknown.

## PROBLEM 14.

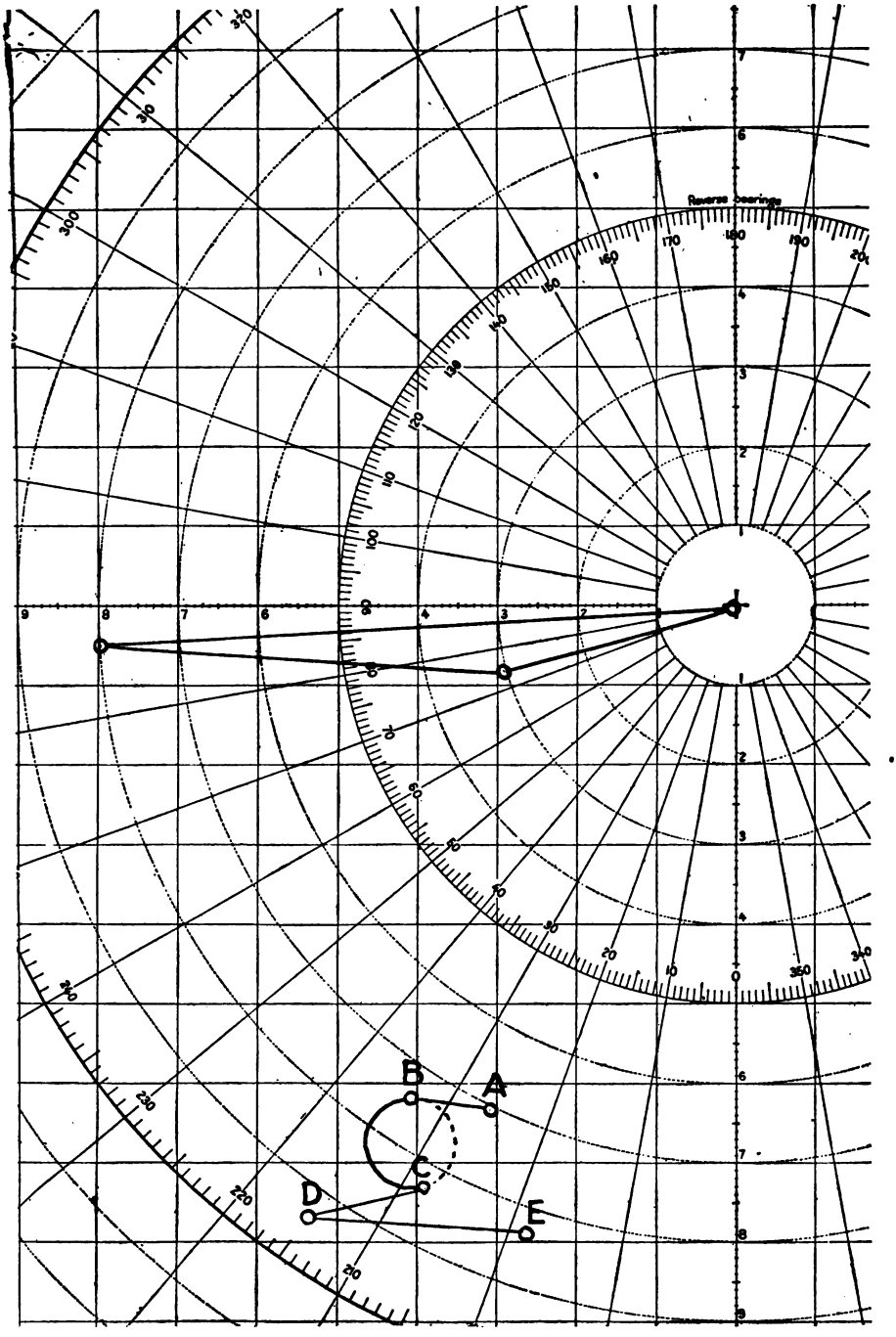
To take a prescribed position with reference to a moving ship involving a countermarch.

A ship at target practice has completed firing the starboard battery and now has the target bearing 18°, distance 8250 yards. She is required to turn and open fire with her port battery, with the target bearing 25°, distance 7000 yards, with the ship on course 93°. The target's course has been found to be 255° and her speed six knots. The ship is to proceed at 16 knots and use a tactical diameter of 1000 yards. How should she be maneuvered to reach her new position?

### SOLUTION.

The commanding officer decides to allow 1000 yards to steady down after completing the turn and before opening fire. He plots the position of the point for opening fire *A*, and measures from this point 1000 yards in the reverse direction of his new course, to point *B*. From point *B* he lays off his turning circle, diameter 1000 yards, tangent to *AB*, and plots point *C*, at which he must put over his rudder. He sees he will have to make about a 16-point turn, and by consulting the table of turning data, finds that this will take him six minutes. His 1000-yard advance along the line *BA* will take him almost two minutes. Hence, when he reaches the point *C* to commence his turn, the target must be eight minutes run behind the position it must occupy when he opens fire. Laying off this distance (1600 yards) along the target's course reversed from *C*, gives the point *D* which marks his bearing and distance from the target on putting over his rudder. He now plots his present relative position *E*, and by the method given in Problem 6, finds the course necessary to change his station from *E* to *D*, which is 265° 30′. He puts the ship on this course and runs till the target bears 35°, distance 9350 yards, at which point he turns with standard half-rudder to his new course.

In practice the course and speed of the target and the point for commencing fire with the port battery will probably be known in sufficient time to enable points *A*, *B*, *C* and *D* to be plotted before the starboard battery has completed its firing. It will remain only to plot the position of the ship when the starboard battery finishes and to find the course to get from this point to the relative position *D*.




PROBLEM 14.—Taking Station on a Moving Ship Involving a 16-Point Turn.

## PROBLEM 15.

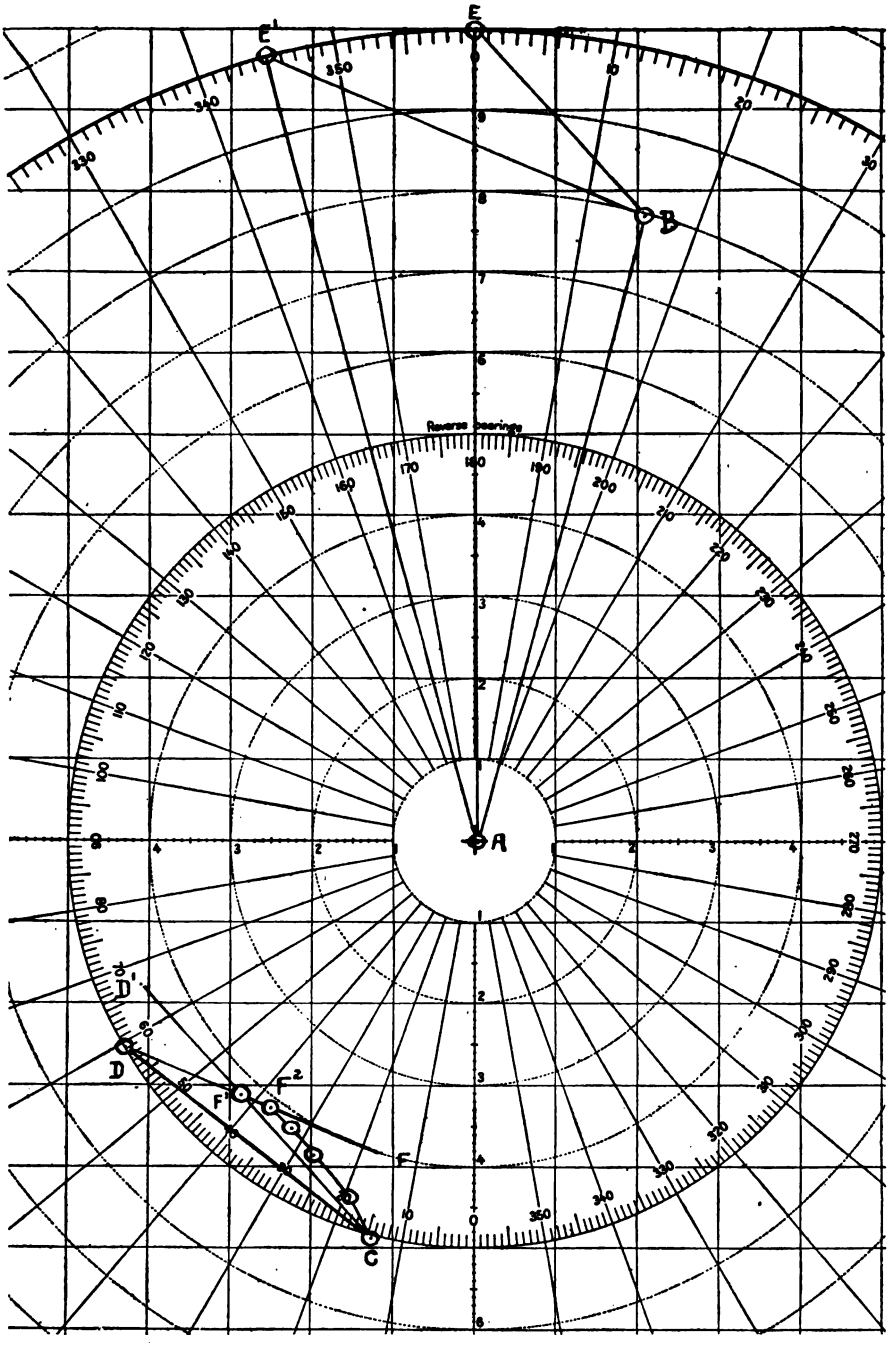
To take a certain position relative to a moving ship using a given speed and changes of course of 15° or multiples thereof.

The fleet is steaming on course 330° at 16 knots. A squadron whose maximum speed is 20 knots is stationed with its guide bearing 195° from the fleet guide at a distance of 5000 yards when a signal is made "fleet change course to the right 45°, retaining present formation." The division commander immediately decides to go "ships right 30°" and to increase speed to 20 knots. How long should he hold this course so that he may bring his division into position by a further simultaneous change of 15°?

### SOLUTION.

Plot *AB*, the course and speed of the fleet guide after making the turn. Plot *C* and *D*, the present position of the division guide, and the position desired, respectively. Plot *AE*, the course and speed that it has been decided to take. Connect *B* and *E* and draw *CD'* parallel to *BE*. *CD'* will be the line of relative movement produced by this course and speed. It is noted that this line passes to the right of point *D* and therefore a further change of course of 15° to the left will be necessary to bring the division into position. Plot *AE'* representing this course (20 knots and 15° to the left of *AE*). *BE'* will then give the direction of the relative movement produced by this new course. Draw *DF* parallel to *BE'*. The intersection *F'* of this line with *CD'* will give the point at which the course must be changed to reach point *D*. The division will therefore stand on course 0° until the fleet flagship bears 43°, distance 4200 yards, when a simultaneous change of course to 345° will be executed. Upon reaching point *D* the division flagship will have reached her station and she should reduce speed to that of the fleet guide and take up a parallel course, other ships swinging to the right and following in her wake.

As a check on the above and to allow for irregularities in making the initial movements, frequent bearings and distances should be taken on the fleet guide. If the maneuver has been accurately performed in all respects, these plots will all fall on the line *CF'*. However, if on account of irregularities these fall to one side, as shown, then the course must be altered sooner than anticipated. Running a line through these points, the intersection of this line with *DF* will give the point $F^2$, at which the change must be made:—in this case, when the fleet guide bears 38°, distance 4150 yards.




PROBLEM 15.—Changing Station by 15° Changes of Course.

## MANEUVERING PROBLEMS FOR EXERCISE.

1. The fleet is steaming on course 293° at 12 knots. A patrol boat is stationed 30° on the port bow of the flagship at 6000 yards distance. The fleet changes course 30° to the left. Find the course which the patrol vessel should take at 14 knots to regain her former position.

*Answer:* 224°.

2. The fleet is steaming on course 105° at 13 knots, in column formation, distance 500 yards. The third ship has fallen out of the formation and now has the fleet guide bearing 142°, distance 3500 yards. Find the course she should steer to regain her position in formation at 15 knots speed and the time it will take.

*Answer:* Course 115° 30′. 22 minutes.

3. A convoy commander receives a radio report of an enemy submarine sighted in a position which bears 133° from his ship, distance 135 miles. What courses may he take at 14 knots speed to insure avoiding the submarine by a distance of five miles, assuming that the submarine's average cruising speed will not exceed eight knots?

*Answer:* Course 96° or 170°.

4. A submarine chaser sights the periscope of a submarine bearing 311°, distance 2500 yards. The submarine's course is estimated at 50° and her submerged speed at 10 knots. It is desired to drop a depth charge 50 yards ahead of the submarine. Find the course to be steered at 15 knots and the time of dropping the charge.

*Answer:* Course 354°, drop depth charge after running 3000 yards, or 6 minutes run.

5. A convoy is standing on course 94° at 12 knots. A cruiser, forming part of the escort, is directed to scout at maximum speed on bearing 64° from the convoy, starting at 6 a. m. and rejoining convoy at 6 p. m. The cruiser has a maximum sustained speed of 16 knots. Find the course which she should steer, the time at which she should return to rejoin the convoy, and the course she should use in returning.

*Answer:* Steer course 86° 30′ until 4.18 p. m., then course 223°.

6. The fleet is steaming on course 55° at 14 knots. A scout accompanying the fleet is ordered to take position on bearing 345°, distance 60 miles, proceeding at 6 a. m. at 22 knots. Find the scout's course and the time she should reach her station.

*Answer:* 22 degrees, 4 hours, 38 minutes, or 10.38 a. m.

**7.** While executing the maneuver called for in the problem above, the scout at 9.27 a. m. receives orders to rejoin the fleet at maximum speed. The scout can make 24 knots. Find the course she should use.

*Answer:* 183°.

**8.** A fleet composed of two squadrons is steaming in line of squadrons on course 12° at 14 knots, interval 10,000 yards, distance 500 yards. The second squadron, which is on the left, is directed to take a position with the guide 45° on the starboard bow of the guide of the first squadron, at 10,000 yards interval. The second squadron is composed of eight ships and has a maximum squadron speed of 19 knots. Find the direct course to be steered by the leader of the second squadron to reach this position and whether this course will allow the tail of the second squadron to clear the head of the first squadron by a safe margin.

*Answer:* Course 44° 30′. Tail of second squadron passes 1700 yards ahead of first squadron.

## CHAPTER XIV.

# DUTIES OF A RECORDER OF A SUMMARY COURT-MARTIAL.

NOTE.—This chapter is prepared from lectures delivered to the midshipmen at the Naval Academy by officers from the Office of the Judge Advocate General. It is only a general guide to the more important duties of a recorder and cannot cover all points that may arise in a trial. In cases other than ordinary, recourse should be had to more comprehensive publications on naval law.

## PRELIMINARY DUTIES.

1. In case an officer is ordered as recorder of a summary court-martial, the order will probably come to him, in writing, from an officer of the naval service empowered by Congress or the Secretary of the Navy to convene summary courts-martial. This order, if in writing, will be signed by this officer and is called the *precept*. It will designate three (3) commissioned officers of the naval service to constitute the membership of the court and an officer as recorder; it is the court's authority to try all cases coming before it. The officer designated as recorder is, by it, made the Government's attorney to prosecute these cases, and, if any accused does not desire counsel, he also is under duty to advise such accused how his case can best be presented to the court.

A recorder should, therefore, assure himself that—

(a) The precept shows on its face that the officer ordering the court has power to convene it;

(b) The court is legally constituted; *i. e.*, composed of three commissioned officers qualified under General Order 296 to try the case; and,

(c) The court has jurisdiction of all cases that come before it, both as to the person and as to the offense.

REFERENCES.—Articles 23, 26, and 27 of the Articles for the Government of the Navy (see Naval Courts and Boards); General Order No. 296 of May 18, 1917; Sections 403-409 (page 232) Naval Courts and Boards.

2. Usually a specification (or specifications) against one or more enlisted men, preferred by the officer ordering the court (or convening authority), will accompany the precept. Additional specifications may be transmitted by the convening authority for the trial of as many other offenders as the convening authority may see fit.

## EXAMINATION OF THE SPECIFICATION.

3. The recorder's chief duty is to present the Government's case fairly to the court; to see that all evidence necessary to prove the specification is placed before it. He should, therefore, assure himself, first, that—

(a) The specification is good; *i. e.*, alleges a distinct offense against naval law and punishable by it; that it is free from all errors; and,

(b) Each offense is charged under a separate specification.

He should then ascertain the time and place of meeting to suit the convenience of the executive officer and the senior member of the court.

NOTE.—The recorder's examination of the specification should not be perfunctory nor cursory. The duty of detecting any errors in it rests primarily with the recorder, because if errors exist therein, they should be corrected, preferably by the convening authority, before the court is convened. He should therefore make a careful examination for typographical errors, errors in spelling, errors in names (checking up the name of the accused with that given in his service record), dates, and all facts and legal features. The specification should be brief, clear, and explicit, containing nothing which is not to the point, and should directly and positively charge the accused with having committed the offense. A good general discussion of the legal requirements of a specification, sufficient for ordinary purposes, and sample forms of specifications may be found in Naval Courts and Boards. If the specification is found bad, the recorder should immediately bring it to the attention of the senior member, who will ordinarily in turn bring the error discovered to the attention of the convening authority in order that a new and correct specification may be made.

## SERVING SPECIFICATION UPON THE ACCUSED.

4. The recorder now having a good specification, together with a copy thereof (which is always furnished with the original), the next step is to serve the copy on the accused. The recorder should therefore request the officer of the deck to have the accused brought to the mast. The recorder should—

(a) Hand the accused the copy of the specification, inviting his attention to the fact of this delivery and note on the copy the time of its delivery;

(b) Inform the accused of the time and place of the trial;

(c) After giving him an opportunity to read over the specification, tell him, in a general way, his rights pertaining to the trial; and,

(d) Find out from him if he will be ready for trial at the time appointed, or if not when he will be ready, reporting any request for delay to the senior member.

NOTE.—The recorder should never make any promises to the accused nor suggest that he plead "guilty." On the contrary, if the accused has any case at all the recorder should advise him to present it fully; that by a plea of "guilty" he can only introduce evidence in extenuation and as to previous good character; that by extenuation is meant *mitigation* and not *justification;* that if he wishes to justify he shall plead "not guilty"; that he may, if he so desire, make an oral statement (not under oath), but such statement shall be of such a nature as not to conflict with his plea of "not guilty"; that he may show grounds for an extension of clemency, but that such statement does not have the same weight as sworn testimony which should be brought out by witnesses, if practicable; that, in general, if there is in his mind any doubt as to the truth of any of the allegations in the specification, he should procure counsel and plead "not guilty." If the accused is in any doubt as to his plea, he should be given time to consider the question before pressing him for a decision on this point.

## SERVICE NOTED IN THE LOG.

5. The recorder should—

(a) Report to the officer of the deck that he has served the accused with a copy of the specification; and,

(b) Make out a memorandum to this effect and the time of service for entry in the log, giving this memorandum to the officer of the deck.

## WORKING UP THE CASE.

6. The recorder should—

(a) Read over all original papers (if there be any) made by the reporting officer and witnesses;

(b) Interview all witnesses for the prosecution; ascertain *fully* what they know about the case, what each can be expected to testify to, and have them immediately available to appear as witnesses when called; and,

(c) If the accused has not decided upon his plea, send for him and inquire as to his intentions. Should he desire counsel and be unable to obtain one, this fact should be brought to the attention of the senior member, who will arrange that counsel for the accused be detailed. If the accused is not represented by counsel, the recorder is, by the provisions of Naval Courts and Boards, placed in the anomalous position of having to look out for the interests of the accused, as well as to prosecute him. The recorder should invite his attention to this fact, that his (the accused's) interests can best be served and his defense best presented by counsel not thus handicapped; that the accused should avail himself of the opportunity to be provided with counsel. Unless the accused is willing unconditionally to admit all the facts alleged in the specification and does not wish to challenge their proof in any

way, the recorder should instruct him to plead "not guilty," and entrust his defense to his counsel. This being the case, it now remains for the recorder only to request that he be furnished, in ample time, with a list of the witnesses desired by the defense.

### THE ACCUSED DESIRES TO MAKE A STATEMENT.

7. In many cases, it will be found that the accused will freely and frankly admit to the recorder that the allegations of the specification are irrefutable, but he will contend that in committing the offense he was under strong provocation and that the circumstances under which it was committed were of a mitigating nature. Here again, the accused should be advised to plead "not guilty" and procure counsel to present his case. Thus to advise him is to insure that the accused has been given full opportunity to make the most of his "day in court," while to advise otherwise is to invite possible inconsistency between the plea of the admission of guilt and the statement of justification tending to remove guilt.

### ILLUSTRATION OF AN INADMISSIBLE STATEMENT.

8. Suppose the accused is charged with unlawfully having in his possession an overshirt, the property of one John Doe, and that, after having pleaded guilty to this charge, he attempts to introduce the statement in substance as follows: "that he purchased the overshirt in question at a recent sale of deserters' effects conducted in the regular and authorized manner on board ship." It is readily apparent that the statement is inconsistent with the plea, the accused having first admitted having the property *unlawfully* in his possession, and later attempting to show that he came into possession *lawfully*. Obviously, such procedure cannot be allowed. If the recorder neglects, in the preparation of his case, to disclose this inconsistency, it would become the duty of the court to direct that the accused change his plea, with resulting confusion to the recorder, who will probably have to request delay in order properly to prepare his case.

### FINAL PREPARATION FOR THE TRIAL.

9. (a) Ascertain from the supply officer the pay of the accused per month and the amount due him on the date of the trial.

(b) Examine the service record of the accused for evidence of previous convictions. If any is found, prepare such evidence for presentation to the court.

(c) See that all witnesses are notified as to the time and place of trial and the approximate time they will be desired by the court.

(d) In ample time before the trial, request the officer of the deck to have the accused, together with the necessary witnesses, sent to the court-room.

(e) Request the executive officer to detail an orderly for the court.

(f) Just before the trial, see that the place of meeting is in readiness, that all papers pertaining to the case and the necessary books, such as Naval Courts and Boards, Navy Digest, Bible, etc., are in place and available for ready reference.

(g) Notify all the members that everything is ready for the court to meet.

**BEGINNING OF TRIAL AND EXAMINATION OF SPECIFICATION.**

10. The court take their seats in the usual order of precedence, the accused being present, and the senior member directs the orderly to report to the officer of the deck that the court has met.

**PRELIMINARY QUESTIONING OF THE ACCUSED.**

11. The recorder asks the accused: "Do you desire counsel?" If the answer is "No," the case proceeds; if "Yes," the accused states whom he desires to act in this capacity, and such person reports as such.

**RIGHT OF CHALLENGE.**

12. The recorder next rises and reads the precept. He then asks the accused, "Do you object to any member of the court?" If the accused objects to any member, he must give his reasons. The challenged member may then reply, both the reasons for the objection and the reply of the challenged member thereto being spread upon the record. The court is then cleared to consider the challenge, the challenged member generally also withdrawing. When the court is opened all parties to the trial enter and the senior member announces the court's decision. If the objection is sustained, the court must adjourn. The recorder should make up and forward the record to the convening authority, who will probably appoint another member. The recorder is not subject to challenge.

**ADMINISTERING OATH TO MEMBERS AND RECORDER.**

13. The oath is administered first by the recorder to the members and then by the senior member to the recorder. The recorder will do well to memorize the oath to members. The members and all parties to the trial should stand while the oaths are being administered.

**DEALING WITH THE SPECIFICATION.**

14. The recorder asks the accused—

(a) If he has received a copy of the specification(s) preferred against him and if so when;

(b) If he has any objections to make to the specification(s); and,

(c) If he is ready for trial.

NOTE.—If the accused replies to (b) in the affirmative, he must state his objections. In any event, the court is cleared for its consideration of the specification(s), and any objections thereto. When the court opens, all parties to the trial enter and the senior member announces that the court finds the specification(s) in due form and technically correct (or as the case may be. Here state any fault it may find. If the fault is one of substance, it should be referred to the convening authority for correction, the correction being also made in the accused's copy). In regard to (c), if the accused desires a postponement, his reasons therefor should be stated and how long a postponement he desires. This will be considered by the court.

## ARRAIGNMENT OF THE ACCUSED.

15. The record must show that no witnesses were present when the accused was arraigned. After reading each specification, the recorder arraigns the accused separately as follows:

Q. John Doe, seaman, U. S. N., you have heard the (the first) specification preferred against you; how say you to the (the first) specification; "guilty" or "not guilty"?

NOTE.—The accused, either himself or through his counsel, may, before pleading to the issue, make preliminary motion or plea. Such motion should ordinarily be in the form of a motion "to strike," but the substance and not the form of the motion is what is to be considered. This motion may be upon various grounds, as explained in Naval Courts and Boards, Sections 296-300.

## PLEA OF THE ACCUSED.

16. The plea of the accused should be either "guilty" or "not guilty." If he stands mute, the trial proceeds as though the plea of "not guilty" had been entered. The court cannot, save in exceptional cases, properly accept, in lieu of the prosecution on all allegations, a plea which admits less than the convening authority has seen fit to charge. If the plea of "guilty" is offered, it becomes the duty of the senior member to warn the accused that in thus pleading he deprives himself of the benefits of a regular defense and can only introduce evidence in extenuation and as to previous good character. If at any time after a plea of "guilty" has been entered, the accused attempts to introduce evidence or make a statement in conflict therewith, the plea must be changed to "not guilty."

## PROSECUTION BEGINS.

17. If a plea of "guilty" has been made, the prosecution rests, unless in the judgment of the court evidence is necessary in order to show the aggravated nature of the case. If the plea of "not guilty" has been entered, the prosecution proceeds to call the first witness. Should it be necessary to call

any member of the court or the recorder to testify for the prosecution, such member or recorder should be called first. All witnesses are sworn by the senior member except when the senior member himself is called as a witness, in which case he is sworn by the member next in seniority who presides for the time being.

## EXAMINATION OF WITNESSES.

18. The proper procedure for the examination of a witness is as follows: First, direct examination by the party who called him; second, cross-examination by the opposite party; third, re-direct examination; and, fourth, re-cross examination; examination by the court. Any member of the court may put questions to the witness, such questions being subject to objection in the same manner as are questions by the parties to the trial. Questions by the court, however, should be of an impartial nature and tend to bring out or clear up any points in the testimony given. At the conclusion of an examination of a witness, his testimony must be read to him and by him pronounced correct. Unless the witness is a member of the court or a party to the trial he should be warned by the senior member, before being allowed to withdraw, not to converse upon matters pertaining to the trial.

## ORAL ARGUMENT UPON ADMISSIBILITY OF EVIDENCE.

19. The manner of introducing various kinds of testimony, the rules of evidence governing it, and the proper method of examination are too comprehensive to be considered here. It may be said, however, that *oral arguments* upon the admissibility of evidence and upon interlocutory proceedings are permissible, but such arguments shall not be recorded. The grounds upon which objections are based and the decisions of the court thereon shall always be recorded.

## DEFENSE BEGINS.

20. The record should show when the prosecution rests and the defense begins. The defense then calls and examines its witnesses with a view to presenting its case in the most favorable light for the accused. The procedure in the examination of witnesses is similar to that of the prosecution, except that the identity of the witness and his recognition of the accused is first established by questions of the recorder. The accused may, *but only if he so requests,* take the stand in his own behalf, but his attention should be called to the fact that in doing so he subjects himself to cross-examination in the same manner as other witnesses, and, should he not desire to avail himself of this privilege, his failure to do so creates no presumption against him.

## REBUTTAL AND SURREBUTTAL.

21. When the defense rests, the prosecution is allowed to call witnesses to rebutt the testimony presented by the defense and if this is done the defense is allowed a surrebuttal in reply.

## REQUEST FOR CLEMENCY.

22. The recorder shall here ask the accused if he desires to make any statement. While neither written defense nor argument is admissible, the accused may make an oral statement of such nature as to fall within the restrictions previously mentioned and request clemency. The substance of this statement must be appended to the record.

## TRIAL FINISHED.

23. The trial is now finished. The court is cleared to consider its finding. When the recorder is called to record the finding he shall immediately thereafter, except in cases of acquittal, state to the court whether or not he has any record of previous conviction(s); he also states the rate of pay of the accused. If there be any record of previous conviction(s), the court is opened, all parties to the trial entering, and the recorder then reads from the official records the previous conviction(s). (See Sections 326-334, Naval Courts and Boards.)

## SENTENCE RECORDED.

24. The court is now cleared for its deliberation upon the sentence. When the sentence has been determined upon, the recorder is recalled to record it. In all cases both the findings and the sentence must appear in the record in the handwriting of the recorder without erasures or interlineations, and in the exact phraseology used in the Articles for the Government of the Navy prescribing the punishments which a summary court martial may impose.

## PREPARATION OF RECORD FOR SIGNATURE.

25. All members and the recorder must sign the record, the recorder having it prepared for their signatures in accordance with their rank and immediately following the sentence.

## RECOMMENDATION FOR CLEMENCY.

26. Should one or more members of the court desire, a recommendation for clemency, giving reasons therefor, may be spread upon the record over his or their signatures. The court then takes up the next case or adjourns to await orders from the convening authority. The record should show a statement to this effect, signed by the senior member and the recorder.

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